



CERTIFICATE OF ACCREDITATION

ANSI-ASQ National Accreditation Board/AClass
500 Montgomery Street, Suite 625, Alexandria, VA 22314, 877-344-3044

This is to certify that

Evans Analytical Group, LLC
15 Morgan Street
Irvine, CA 92618

has been assessed by AClass
and meets the requirements of international standard

ISO/IEC 17025:2005

while demonstrating technical competence in the field(s) of

TESTING

Refer to the accompanying Scope(s) of Accreditation for information regarding the types of tests to which this accreditation applies.

AT-1663

Certificate Number

A handwritten signature in black ink, appearing to read "Keith Greenaway", written over a horizontal line.

AClass Approval

Certificate Valid: 05/10/2012-05/10/2014
Version No. 001 Issued: 05/11/2012



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated January 2009*).



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

Evans Analytical Group, LLC

15 Morgan St., Irvine, CA 92618
Patrick Trumpet Phone: 858-449-7485

TESTING

Valid to: May 10, 2014

Certificate Number: AT- 1663

I. Electrical

Table with 5 columns: FIELD OF TEST, ITEMS, MATERIALS OR PRODUCTS TESTED, SPECIFIC TESTS OR PROPERTIES MEASURED, SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED, DETECTION LIMIT / RANGE / EQUIPMENT. Rows include Voltage Stress for Integrated Circuits with various test parameters and standards.



II. Thermal

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	DETECTION LIMIT / RANGE / EQUIPMENT
Environmental Stress	Integrated Circuits	HTOL (High Temperature Operating Life)	JESD22-A108	85 °C ~ 150 °C ±3 °C (1 to 4) V/(0-52) A ADEC 7056/92 AEHR Max2
		HTSL (High Temperature Storage Life)	JESD22-A103	150 °C (- 0 °C, +10 °C) Thelco
		THB (Temperature Humidity Bias)	JESD-A101	85 °C ±2 °C 85 %RH ± 5% non-Condensing Thermotron SM-32C
		PPOT – Pressure Pot (Autoclave)	JESD22-A102	121 °C ±2 °C 29.7 PSIA 100% RH Hirayam R7/8 HA240MIV
		HAST (Highly Accelerated Stress Test)	JESD22-A110	110°C ±2°C 17.7psia 130 ±2°C, 33.3psia 85% RH ±5% Trio-tech 1000X Hirayama R7/8
		TMCL – Temperature Cycling	JESD22-A104 Mil Std. 883 TM 1010	Condition A-N (air to air) (-65 to 150) °C (10-15) min Dwell <10 s transfer ESPEC TSE-11 TSA70/100
		Thermal Shock	JESD22-A106 Mil Std. 883 TM 1011.9	(-65 to 150) °C (Liquid to Liquid) 5 min dwell <10 s transfer Blue M LTB-ATS-B

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Environmental Stress	Integrated Circuits	Moisture Reflow Sensitivity	JESDC-J-STD-020	Level 1 ~ 6 HAFO 1600 Bake 125+ (-0 to 5) °C ESPEC PRA-2AP 30 °C to 85 °C, ±2 °C (60 to 85)%RH ±3% HELLER 1500. 1809 260 °C peak reflow
		Preconditioning	JESD22-A113	Level 1 ~ 6 HAFO 1600 Bake 125+(-0 to 5) °C ESPEC PRA-2AP 30 °C to 85 °C, ±2°C (60 to 85)%RH +3% HELLER 1500. 1809 260 °C peak reflow ESPEC TH HELLER reflow

III. Optical

FIELD OF TEST	ITEMS, MATERIALS OR PRODUCTS TESTED	SPECIFIC TESTS OR PROPERTIES MEASURED	SPECIFICATION, STANDARD METHOD OR TECHNIQUE USED	DETECTION LIMIT / RANGE / EQUIPMENT
*Failure Analysis	Integrated Circuits and Electronic Components	X-Ray	MIL-STD-883, Method 2012.7 Customer and Sample Dependent	Phoenix PCBA Inspector, CR Technology CRX1000; Operating voltage- up to 90 kV and 160 kV; 5 axis movement; Sample stage < (12 in X 24 in)
		CSAM - Scanning Acoustic Microscopy	Pulse Echo and Through Transmission (2D) Customer and Sample Dependent	Sonix UHR2000, UHR2001; Range (15 – 175) MHz transducers; Pulse Echo and Through Transmission; JEDEC tray scan (322.6 mm x 135.9 mm)



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*Failure Analysis	Integrated Circuits and Electronic Components	EDX - Energy Dispersive X-ray Spectroscopy	Customer and Sample Dependent	Noran Oxford Elements C to U; (5- 30) keV; Line scan; Dot map
		Bond Shear Test	JEDEC – JESD22-B117; JEDEC – JESD22-B116; AEC-Q100;	Royce Instrument ASTM-2K BPTM-5K Capacity 2.0 kgf max; Accuracy: +/-0.006 kgf;
		Wire Pull Test	MIL-STD-883 Method 2011.7; AEC-Q100;	Royce Instrument RPTM-100 Capacity 100 gf max; Accuracy: ± 0.2 gf
		DBFIB - Dual Beam Focused Ion Beam	Gallium Ion Source Customer and Sample Dependent	FEI Nova Nanolab Dual-Beam FIB; Knights CAD navigation; Cross-sectioning sub-micron features by “slice and view”; 6 in wafer / sample capacity; Ion channeling imaging
		IR- Infrared Microscope	Curve Tracer	QFI Infrascopes III InSb focal plane array detector; IR wavelength; FOV 5 mm x5 mm
		SEM- Scanning Electron Microscope	Customer and Sample Dependent	Hitachi 4500, JEOL 6700; Field Emission; (1 – 30) keV; Up to 25 mm x 35 mm stage movement
		XIVA - Externally Induced Voltage Alteration	Bias Voltage	Opto Metrix LSM-3020C XIVA Sensor 1340nm laser; FOV 5x5 mm; Lock-in mode; Seebek mode, Constant current source



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*Failure Analysis	Integrated Circuits and Electronic Components	LEM - Light Emission Microscope	Curve Tracer Qualitative measurements	AlphaInnotech Optical Microscope Si CCD detector; FOV 10 mm x10 mm

Notes:

1. This scope is part of and must be included with the Certificate of Accreditation No. AT- 1663



Vice President

