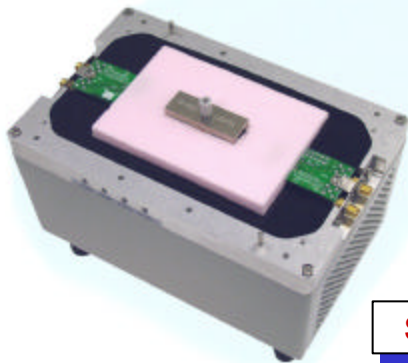




W-2200 BENCH TOP TEMPERATURE TEST SYSTEM With 250B-1 or 250C Network Analyzer

- Automated, software-based quartz dual crystal temperature test system
- Measures over 75 different tests
- Two crystal capacity
- Parameter and curve fit characteristics are checked against easy to define QC limits
- Precision Crystal Temperature Perturbation Analysis
- Example Perturbation Test:
 - - 40° C to +105° C
 - Over 1000 temperature points
 - Total test time of 45 minutes for SMD crystals
- Available test fixtures holding two SMD devices:
 - 2x2.5mm, 2.5x3mm, 3.2x5mm
 - 3.5x6mm, 5x7mm
 - HC-49U, HC-49SMD, HC-49SMD-LP
 - Custom



- All data is published in a **Microsoft Access™** data base
- Data can be exported to **Microsoft Excel™** for custom data analysis
- Printouts are generated using **Crystal Reports®**

SPECIFICATIONS

250B-1 Frequency Range:	15 KHz to 220 MHz
250C Frequency Range:	15 KHz to 500 MHz
Frequency Correlation:	± 1 ppm* at series (typical)
Crystal power:	1 nW to 1000 uW (1 MHz to 50 MHz) 1 nW to 500 uW (>50 MHz to 200 MHz)
Temperature Range:	- 40° C to +105° C @ 25° C Ambient
Temperature Stability:	± 0.1° C

* Proprietary measurement and calibration algorithms provide correlation to industry standard crystal measurement equipment.

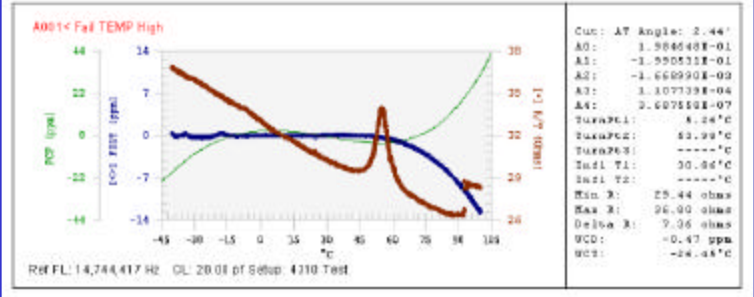
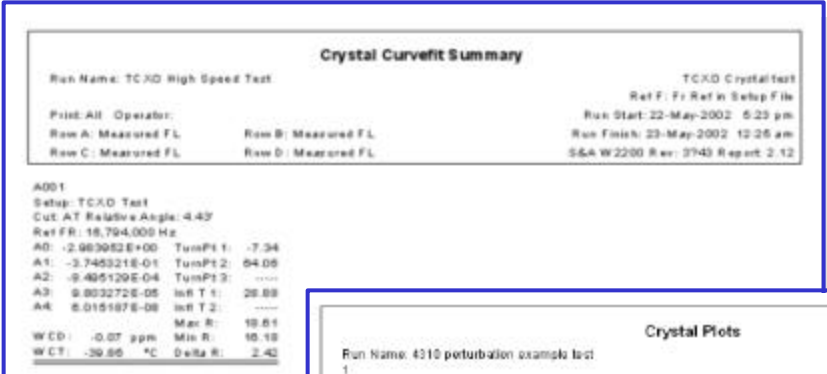
SAUNDERS & ASSOCIATES, LLC

2520 E. Rose Garden Lane - Phoenix, Arizona 85050 USA (602) 971-9977 FAX (602) 971-5522
E-Mail sales@saunders-assoc.com - World Wide Web <http://www.saunders-assoc.com>

SYSTEM CONFIGURATION

- S&A 250B-1 or 250C Network Analyzer
- S&A 4310 Bench Top Temperature Test Chamber
- Dual IEC-444 Pi-Network Test Head
- S&A PCI TTL I/O CARD
- **Windows® based System Software**
- **Printer (Optional)**
- **Computer Requirements:**
 Minimum 500 MHz Pentium III
 One full PCI slot with +3.3V & 5V power,
 Windows XP®

SAMPLE REPORTS



Crystal Tabular

Run Name: TCXD High Speed Test
 TCXD Crystal test
 Ref F: Fr Ref In Setup File
 Run Start: 22-May-2002 5:23 pm
 Run Finish: 23-May-2002 12:26 am
 S&A W2200 Rev: 3743 Report: 2.12

Print: All Operator:
 Row A: Measured FL Row B: Measured FL
 Row C: Measured FL Row D: Measured FL

A001
 Setup: TCXD Test
 Ref F: 16,794,000 Hz
 A0: -2.963052E+00 TurnP1: -7.34
 A1: -3.745521E-01 TurnP2: 64.09
 A2: -9.495120E-04 TurnP3: ----
 A3: 8.803272E-05 Int T 1: 26.89
 A4: 6.016167E-06 Int T 2: ----
 WCD: -0.07 ppm Min R: 16.18
 WCT: -39.66 °C Delta R: 2.42

°C	FR ppm	Capac	Delta	R
-40.06	-0.09	18.49		
-39.88	-0.95	18.61		
-39.10	-0.20	18.68		
-38.20	-7.37	18.55		
-37.37	-6.62	18.47		
-36.53	-5.92	18.48		
-35.69	-5.24	18.41		
-34.86	-4.58	18.37		
-34.01	-3.95	18.35		
-33.20	-3.37	18.34		
-32.32	-2.77	18.27		
-31.51	-2.24	18.25		
-30.68	-1.73	18.20		
-29.84	-1.19	18.12		
-29.00	-0.71	18.10		
-28.16	-0.25	18.11		
-27.33	0.21	18.09		
-26.50	0.66	18.04		
-25.65	1.00	18.01		
-24.83	1.41	17.95		
-23.99	1.77	17.94		
-23.15	2.09	17.92		
-22.34	2.41	17.89		
-21.49	2.69	17.89		
-20.67	2.87	17.82		
-19.84	3.21	17.90		
-19.03	3.45	17.94		

Crystal Curvfit Tabular

Run Name: TCXD High Speed Test
 TCXD Crystal test
 Ref F: Fr Ref In Setup File
 Run Start: 22-May-2002 5:23 pm
 Run Finish: 23-May-2002 12:26 am
 S&A W2200 Rev: 3743 Report: 2.12

Print: All Operator:
 Row A: Measured FL Row B: Measured FL
 Row C: Measured FL Row D: Measured FL

A001
 Setup: TCXD Test
 Angle: AT(4.43)
 Ref F: 16,794,000 Hz
 A0: -2.963052E+00 TurnP1: -7.34
 A1: -3.745521E-01 TurnP2: 64.09
 A2: -9.495120E-04 TurnP3: ----
 A3: 8.803272E-05 Int T 1: 26.89
 A4: 6.016167E-06 Int T 2: ----
 WCD: -0.07 ppm Min R: 16.18
 WCT: -39.66 °C Delta R: 2.42

°C	FR ppm	Capac	Delta	R
-40.06	-0.09	18.00	-0.02	18.49
-39.88	-0.95	18.00	-0.07	18.61
-39.10	-0.20	18.17	-0.03	18.68
-38.20	-7.37	18.30	-0.02	18.55
-37.37	-6.62	18.44	0.02	18.47
-36.53	-5.92	18.50	0.02	18.48
-35.69	-5.24	18.26	0.01	18.41
-34.86	-4.58	18.61	0.03	18.37
-34.01	-3.95	18.57	0.02	18.35
-33.20	-3.37	18.39	0.02	18.34
-32.32	-2.77	18.78	0.01	18.27
-31.51	-2.24	18.24	0.00	18.25
-30.68	-1.73	18.71	-0.02	18.20
-29.84	-1.19	18.30	0.01	18.12
-29.00	-0.71	18.71	0.00	18.10
-28.16	-0.25	18.26	-0.01	18.11
-27.33	0.21	18.19	0.01	18.09
-26.50	0.66	18.61	0.04	18.04
-25.65	1.00	18.51	0.04	18.01
-24.83	1.41	18.00	0.03	17.95
-23.99	1.77	18.74	0.02	17.94
-23.15	2.09	18.08	0.00	17.92
-22.34	2.41	18.28	0.02	17.90
-21.49	2.69	18.60	0.04	17.89

Crystal Setup File Parameters

Run Name: TCXD High Speed Test
 TCXD Crystal test
 Ref F: Fr Ref In Setup File
 Run Start: 22-May-2002 5:23 pm
 Run Finish: 23-May-2002 12:26 am
 S&A W2200 Rev: 3743 Report: 2.12

Print: All Operator:
 Row A: Measured FL Row B: Measured FL
 Row C: Measured FL Row D: Measured FL

Status: A001 Stop: B180
 Setup: TCXD Test TCXD Crystal perturbation test
 Reference F: 16,794,000 Hz Power: 10.00 uW into 10.00 Ohms Measure: FR/T

STATUS	FR	CO	SR	CL	L	PHB	WCD	DLTR	
	ppm	pF	Ohms	Hz	nH	uW	ppm	Ohms	
A001	PA00	-9.3	2.1	26.9	7.9	11.52	50	-0.1	2.4

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