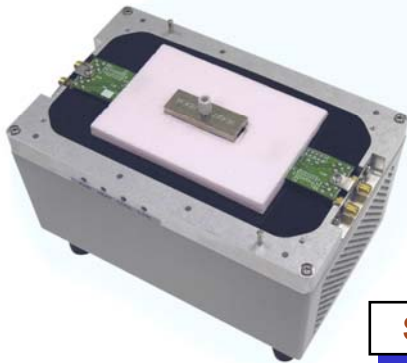




W-2200 BENCH TOP TEMPERATURE TEST SYSTEM

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:
(typical)

± 1 ppm* at series

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.

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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 Curvfit Summary			
Run Name: TCXO High Speed Test		TCXO Crystal test	
Print: All Operator:		Ref F: Fr Ref in Setup File	
Row A: Measured FL	Row B: Measured FL	Run Start: 22-May-2002 5:23 pm	
Row C: Measured FL	Row D: Measured FL	Run Finish: 23-May-2002 12:25 am	
		S&A W2200 Rev: 3743 Report: 2.12	

A001
 Setup: TCXO Test
 Cut: AT Relative Angle: 4.43°
 Ref F: 16,794,000 Hz
 A0: -2.983952E+00 TurnPt 1: -7.34
 A1: -3.745321E-01 TurnPt 2: 64.06
 A2: -8.405120E-04 TurnPt 3: -----
 A3: 9.803272E-05 Inft T 1: 28.88
 A4: 6.015167E-08 Inft T 2: -----
 WCD: -0.07 ppm Min R: 18.61
 WCT: -39.86 °C Delta R: 2.42

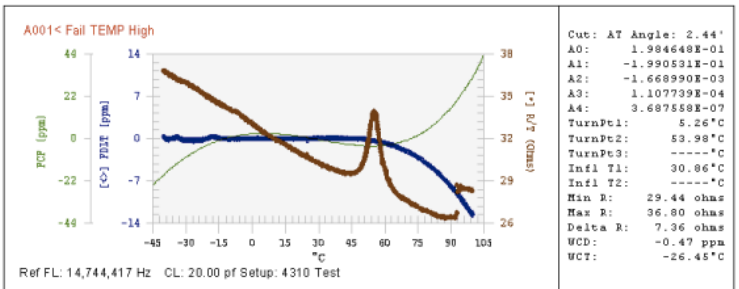
Crystal Plots	
Run Name: 4310 perturbation example test 1	Ref F: F @ 25.00°C (Set)
Print: All Operator:	Run Start: 06-Oct-2005 5:16 pm
Row A: Measured FL	Run Finish: 06-Oct-2005 5:49 pm
	S&A W2200 Rev: 3.50 Report: 2.22

Crystal Tabular	
Run Name: TCXO High Speed Test	TC
Print: All Operator:	Ref F: Fr R
Row A: Measured FL	Run Start: 22-May-
Row C: Measured FL	Run Finish: 23-May-
	S&A W2200 Rev: 3743

A001		
Setup: TCXO Test		
Ref F: 16,794,000 Hz		
°C	FR ppm	R
-40.06	-9.09	18.49
-39.86	-8.95	18.61
-39.10	-8.20	18.56
-38.20	-7.37	18.56
-37.37	-6.62	18.47
-36.53	-5.92	18.46
-35.69	-5.24	18.41
-34.86	-4.58	18.37
-34.01	-3.95	18.36
-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
-28.99	-0.71	18.15
-28.16	-0.25	18.11
-27.33	0.21	18.09
-26.50	0.65	18.04
-25.65	1.06	18.01
-24.83	1.41	17.95
-23.99	1.77	17.94
-23.15	2.08	17.92
-22.34	2.41	17.88
-21.49	2.60	17.86
-20.67	2.97	17.82
-19.84	3.21	17.90
-19.02	3.43	17.76

Crystal Curvfit Tabular			
Run Name: TCXO High Speed Test			
Print: All Operator:			
Row A: Measured FL	Row B: Measured FL		
Row C: Measured FL	Row D: Measured FL		

A001				
Setup: TCXO Test				
Angle: AT(4.43°)				
Ref F: 16,794,000 Hz				
°C	FR ppm	Curve	Delta R	
-40.06	-9.09	-9.06	-0.02	18.49
-39.86	-8.95	-8.88	-0.07	18.61
-39.10	-8.20	-8.17	-0.03	18.56
-38.20	-7.37	-7.36	-0.02	18.56
-37.37	-6.62	-6.64	0.02	18.47
-36.53	-5.92	-5.93	0.02	18.46
-35.69	-5.24	-5.26	0.01	18.41
-34.86	-4.58	-4.61	0.03	18.37
-34.01	-3.95	-3.97	0.02	18.36
-33.20	-3.37	-3.39	0.02	18.34
-32.32	-2.77	-2.78	0.01	18.27
-31.51	-2.24	-2.24	0.00	18.25
-30.68	-1.73	-1.71	-0.02	18.20
-29.84	-1.19	-1.20	0.01	18.12
-28.99	-0.71	-0.71	0.00	18.15
-28.16	-0.25	-0.25	-0.01	18.11
-27.33	0.21	0.19	0.01	18.09
-26.50	0.65	0.61	0.04	18.04
-25.65	1.06	1.01	0.04	18.01
-24.83	1.41	1.39	0.03	17.95
-23.99	1.77	1.74	0.02	17.94
-23.15	2.08	2.08	0.00	17.92
-22.34	2.41	2.39	0.02	17.88
-21.49	2.60	2.58	0.02	17.86



Cut: AT Angle: 2.44°
 A0: 1.984640E-01
 A1: -1.990531E-01
 A2: -1.668990E-03
 A3: 1.107739E-04
 A4: 3.687558E-07
 TurnPt1: 5.26°C
 TurnPt2: 53.98°C
 TurnPt3: -----°C
 Inft T1: 30.86°C
 Inft T2: -----°C
 Min R: 29.44 ohms
 Max R: 36.80 ohms
 Delta R: 7.36 ohms
 WCD: -0.47 ppm
 WCT: -26.45°C

Crystal Setup File Parameters									
Run Name: TCXO High Speed Test					TCXO Crystal test				
Print: All Operator:					Ref F: Fr Ref in Setup File				
Row A: Measured FL	Row B: Measured FL				Run Start: 22-May-2002 5:23 pm				
Row C: Measured FL	Row D: Measured FL				Run Finish: 23-May-2002 12:25 am				
					S&A W2200 Rev: 3743 Report: 2.12				
Start: A001 Stop: D160									
Setup: TCXO Test TCXO Crystal perturbation test									
Reference F: 16,794,000 Hz Power: 10.00 uW into 10.00 Ohms Measure: FR/T									
	STATUS	FR	CO	RR	CL	L	PWR	WCD	DLTR
		ppm	pF	Ohms	fF	nH	uW	ppm	Ohms
A001	PASS	-9.1	2.1	18.5	7.8	11.52	10	-0.1	2.4

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