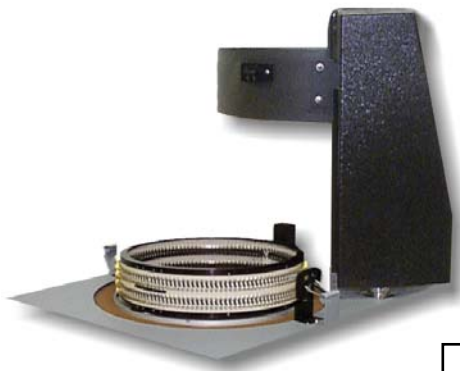


## W-2200 TEMPERATURE TEST SYSTEM

With 250B-1 or 250C Network Analyzer

- Automated, software-based quartz crystal temperature test system
- Measures over 75 different tests
- Parameter and curve fit characteristics are checked against easy to define QC limits
- Crystals of different frequencies can be tested in a single temperature run
- All data is published in a *Microsoft Access*<sup>™</sup> data base
- Data can be exported to *Microsoft Excel*<sup>™</sup> for custom data analysis
- Printouts are generated using *Crystal Reports*<sup>®</sup>
- Crystal part number can be used to set complete measurement parameters, QC limits, temperature test points, and data printouts



- Accommodates dual row test wheel with extended life test head contacts
- Easily loaded S&A proprietary sockets accept HC-45, HC-49, HC-43, HC-49US, HC-18, SMD and tubular type packages
- Typically holds 254 devices per run
- Dual Chamber configuration available

### 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 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 2451 Switch Controller (only required in dual chamber configuration)
- S&A 4220 Temperature Test Chamber (LCO<sub>2</sub>, LN<sub>2</sub>, or Mechanical Refrigeration Cooling)
- IEC-444 Pi-Network Test Head
- Windows® based System Software
- Printer (Optional)
- Computer Requirements:
  - Minimum 500 MHz Pentium III
  - One full PCI slot with +3.3V & 5V power, Windows 98®

## SAMPLE REPORTS

### Crystal Plots

Run Name: Crystal Test Run  
 Ref F: F @ 25.00°C (Set)  
 Run Start: 10-Nov-2001 9:37 am  
 Run Finish: 10-Nov-2001 10:15 am  
 S&A W2200 Rev: 1732

A001  
 Cut: AT Angle: 4.62°  
 A0: -4.120627E-01  
 A1: -3.901947E-01  
 A2: 1.015448E-04  
 A3: 1.015448E-04  
 A4: 3.924615E-09  
 TurnP1: -7.23 °C  
 TurnP2: 64.46 °C  
 TurnP3: ----- °C  
 InE1 T1: 20.96 °C  
 InE1 T2: ----- °C  
 Res R: 14.80 ohms  
 Res R: 17.27 ohms  
 Delta R: 0.47 ohms  
 WCD: 0.06 ppm  
 WCT: 40.02 °C

### Crystal Condensed Plots

Run Name: Crystal Test Run  
 Ref F: F @ 25.00°C (Set)  
 Run Start: 10-Nov-2001 9:37 am  
 Run Finish: 10-Nov-2001 10:15 am  
 S&A W2200 Rev: 1732

### Crystal Tabular

Run Name: Example Run  
 Ref F: F @ 25.00°C (Set)  
 Run Start: 26-Oct-2001  
 Run Finish: 26-Oct-2001  
 S&A W2200 Rev: 1725

A001 <2a001>	A002 <2a002>	A003 <2a003>	A004 <2a004>	A005 <2a005>								
Setup: 12megw2	Setup: 12megw2	Setup: 12megw2	Setup: 12megw2	Setup: 5								
Ref F: 12,795,174 Hz	Ref F: 12,795,955 Hz	Ref F: 12,795,917 Hz	Ref F: 12,795,942 Hz	Ref F: 5								
°C	FR ppm	R	°C	FR ppm	R	°C	FR ppm	R	°C	FR ppm	R	
25.01	0.00	4.92	25.03	0.00	18.71	25.02	0.00	12.39	25.01	0.00	11.97	25.00
0.01	0.01	5.13	0.01	8.08	21.44	0.00	3.28	12.96	-0.01	3.74	12.49	0.00
5.02	0.33	4.98	5.00	8.79	20.77	4.98	3.16	12.82	4.99	3.52	12.38	5.00
9.98	0.44	5.03	10.00	5.24	20.39	10.00	2.68	12.83	10.00	2.94	12.39	9.99
15.02	5.00	5.03	15.01	3.80	10.81	15.00	3.07	13.58	14.99	3.33	13.33	14.99
20.00	0.36	5.02	20.00									
25.00	0.09	5.05	25.01	-0								
30.02	-0.12	5.04	30.01	-2								
34.99	-0.39	5.03	35.00	-3								
40.02	-0.55	5.04	40.02	-5								
45.03	-0.52	5.06	45.02	-7								
49.99	-0.20	5.00	49.99	-8								
54.99	0.33	4.98	55.00	-9								
59.99	1.33	5.05	59.99	-9								

### Crystal Curvefit Summary

Run Name: Example Run  
 Ref F: F @ 25.00°C (Set)  
 Run Start: 26-Oct-2001 4:51 pm  
 Run Finish: 26-Oct-2001 6:34 pm  
 S&A W2200 Rev: 1725

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

### Crystal Curvefit Tabular

Run Name: Example Run  
 Ref F: F @ 25.00°C (Set)  
 Run Start: 26-Oct-2001 4:51 pm  
 Run Finish: 26-Oct-2001 6:34 pm  
 S&A W2200 Rev: 1725

Measured FL	Measured FL	Measured FL	Measured FL
25.01	0.00	0.00	0.00
0.01	0.01	0.01	0.01
5.02	0.33	4.98	5.00
9.98	0.44	5.03	10.00
15.02	5.00	5.03	15.01
20.00	0.36	5.02	20.00
25.00	0.09	5.05	25.01
30.02	-0.12	5.04	30.01
34.99	-0.39	5.03	35.00
40.02	-0.55	5.04	40.02
45.03	-0.52	5.06	45.02
49.99	-0.20	5.00	49.99
54.99	0.33	4.98	55.00
59.99	1.33	5.05	59.99

### Crystal Setup File Parameters

Run Name: Example Run  
 Ref F: F @ 25.00°C (Set)  
 Run Start: 26-Oct-2001 4:51 pm  
 Run Finish: 26-Oct-2001 6:34 pm  
 S&A W2200 Rev: 1725

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

Setup: 12megw2  
 Reference F: 12,795,900 Hz  
 CL: 0.00 pF  
 Power: 100.00 uW  
 Into: 12.00 Ohms  
 Measure: FR/T

STATUS	FR	CO	BB	Q	CL	L	PWR	TEMP	F/T
ppm	pF	Ohms	k	IF	uW	uW	°C	ppm	
10.0	3.0	25.0		13.0	13.00				
+10.0	3.5			12.0	11.00				

### Crystal Failures Only

Run Name: Example Run  
 Ref F: F @ 25.00°C (Set)  
 Run Start: 26-Oct-2001 4:51 pm  
 Run Finish: 26-Oct-2001 6:34 pm  
 S&A W2200 Rev: 1725

Crystal#	Serial#	Setup File Parameters	Crystal Data	Curvefit Parameter
A001	<2a001>	Fail FR Low		

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