



TRUE TECHNOLOGIES

LIFETEST

True Technologies' LifeTest has been developed specifically for monitoring any device that has electrical current flowing through it during reliability or life testing.



LIFETEST

LifeTest is Flexible and Capable

Testing Applications

- Loudspeaker Transducers
- Passive and Active Loudspeaker Systems
- Power Amplifiers
- Crossovers and other circuits

Testing Capability

- Current Flow
- Loudspeaker Small Signal Parameters (TSPs)
- Temperature and Humidity



LifeTest vs. Typical

Comparing LifeTest capability and features to typical power test systems in loudspeaker engineering centers and factories around the world

Feature	LifeTest	Typical System
Easy to install and calibrate with few engineering hours involved	Yes	No
Computer controlled with electronic records of DUT (Device Under Test) performance over the life of the test - easily archived and retrieved	Yes	No
Complete flexibility in channel setup – signal source/level, test duration, start time	Yes	No
Up to 24 channels of current monitoring on a single PC. Every channel can be independently setup or channels can be grouped in blocks.	Yes	No
Save test configuration for repetitive testing tasks	Yes	No
Up to 24 channels temperature sensing for ambient and DUT component monitoring. Temperature records synched with current record for each channel	Yes	No
Up to 6 channels of humidity sensing for ambient conditions tracking – readings stored and synchronized in time with current readings	Yes	No
Pause any channel or block of DUTs to inspect without affecting other tests or test timing	Yes	No
Failure codes provided on failed DUTs – any unit can be replaced within a test block and test timing is accurately maintained	Yes	No
Ability to monitor speaker small signal parameters (e.g. fs, Re, Qts) on all channels and record throughout the test with minimal interference to ongoing test	Yes	No

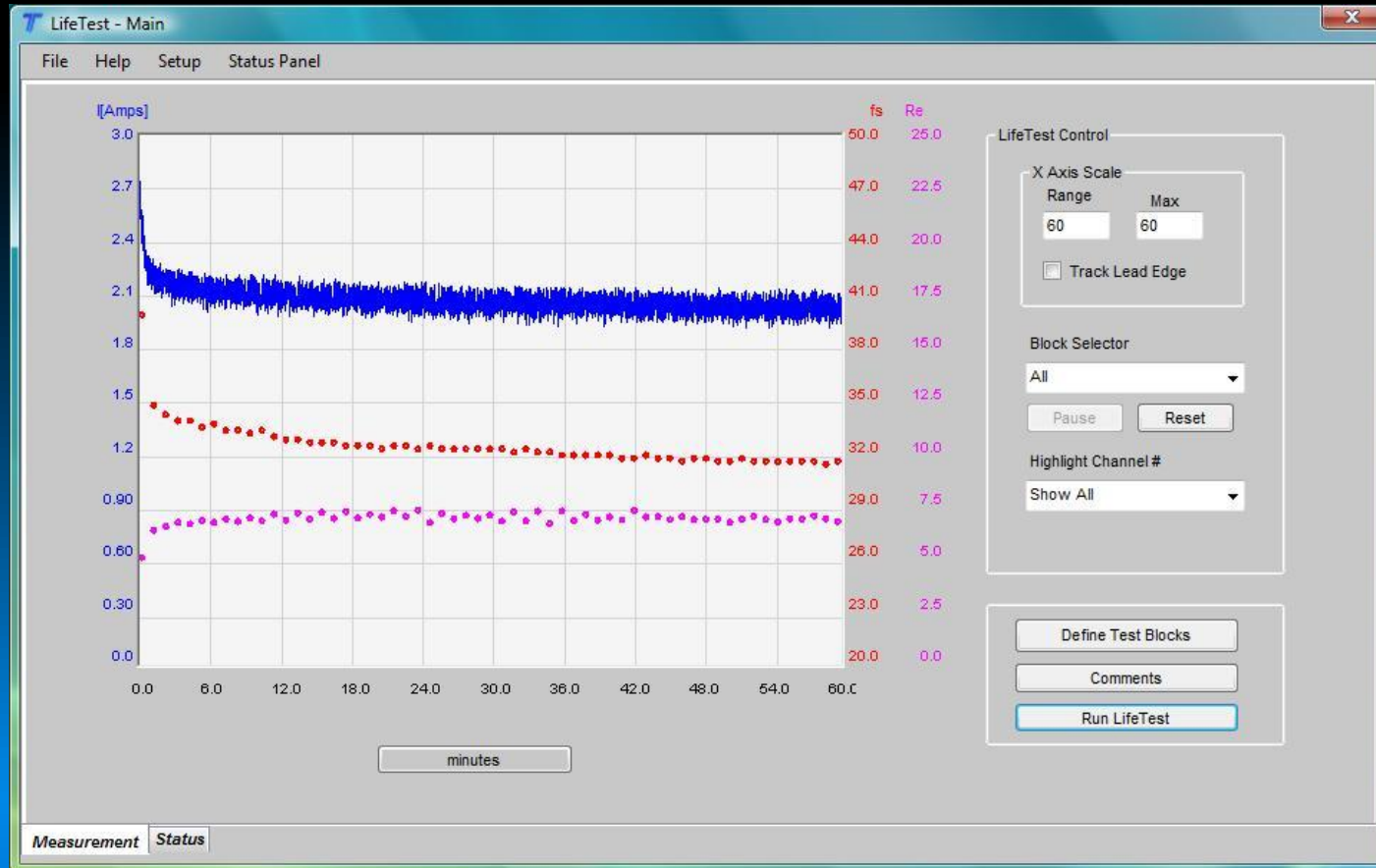


LifeTest vs. Typical (cont.)

Feature	LifeTest	Typical System
Includes signal generator software for making industry standard and custom signal wave files with filtering and crest factor control. Setup up noise, sine ramps, tone bursts, etc. in minutes	Yes	No
Type in desired voltage or power level. Rms and peak output levels are precise with no need to set using external voltmeters. Software meters provide real time voltage readings on every channel	Yes	No
System controls output signal on all channels – signal type and level. No need for external noise generators, CD players, filters, clipping circuits, etc.	Yes	No
Easy Power Ramping (increased output at controlled intervals) and Duty Cycling (on/off cycles at controlled intervals)	Yes	No
Automatic shut down of any channel on short or open circuit conditions where current falls outside set limits. Limits automatically adjust with power ramping	Yes	No
Automatic current limit setting – sets limit based on first minutes of test. Ideal when testing with music signals	Yes	No
Remotely monitor multiple DUT blocks from multiple locations over intranet or internet. Periodic email reports	Yes	No
Automatically restart of system after AC power failure. Email notification sent to test owner and precise test timing maintained	Yes	No
“User Proofed” software prevents amplifiers from being driven beyond voltage and current capability	Yes	No



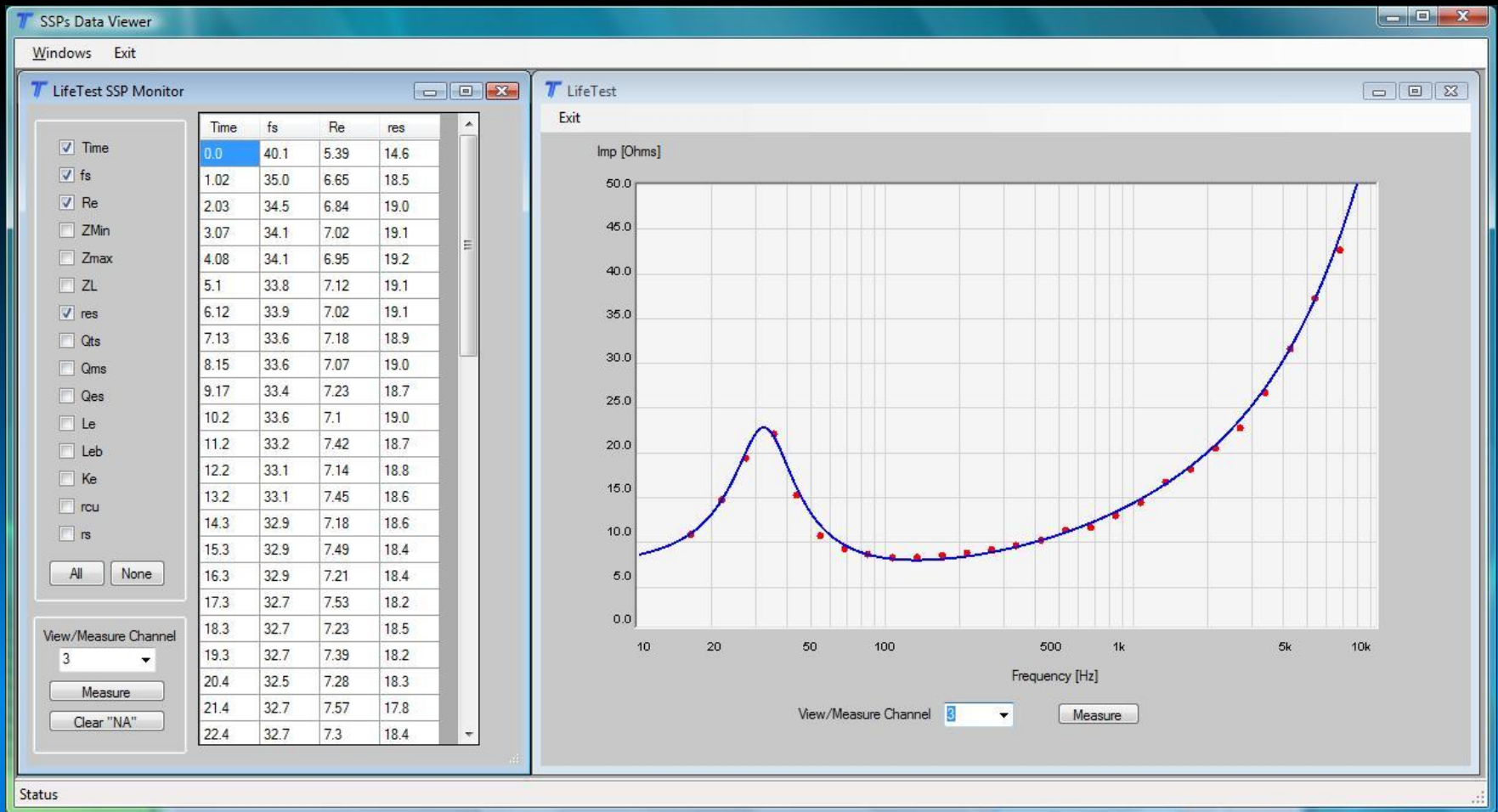
LifeTest – Main Screen



8" Woofer @ 75 Watts. Monitoring Current, Fs, and Re vs. Time



Small Signal Parameter Monitor



A Robust Multitone Signal and Complex Curve Fitting
Algorithm Extract SSPs in < 0.5 Seconds

DUT Block Setup

LifeTest - Block Setup

Exit

Block Name: Demo With SSPs

New Edit Pause

Remove Save Block Load Setup Comments

Select DUT Channels for testing

<input checked="" type="checkbox"/> Channel 1	Sub X11-B1	<input type="checkbox"/> Channel 9		<input type="checkbox"/> Channel 17	
<input checked="" type="checkbox"/> Channel 2	Sub X11-B2	<input type="checkbox"/> Channel 10		<input type="checkbox"/> Channel 18	
<input checked="" type="checkbox"/> Channel 3	8" OEM Car Spkr	<input type="checkbox"/> Channel 11		<input type="checkbox"/> Channel 19	
<input checked="" type="checkbox"/> Channel 4	Sub X11-B3	<input type="checkbox"/> Channel 12		<input type="checkbox"/> Channel 20	
<input checked="" type="checkbox"/> Channel 5	SN 123-1	<input type="checkbox"/> Channel 13		<input type="checkbox"/> Channel 21	
<input checked="" type="checkbox"/> Channel 6	SN 123-2	<input type="checkbox"/> Channel 14		<input type="checkbox"/> Channel 22	
<input checked="" type="checkbox"/> Channel 7	SN 123-3	<input type="checkbox"/> Channel 15		<input type="checkbox"/> Channel 23	
<input checked="" type="checkbox"/> Channel 8	SN 123-4	<input type="checkbox"/> Channel 16		<input type="checkbox"/> Channel 24	

Test Signal

Wave File: RS426B CFdB(dB)6.17.wav

Wave Length: 11.88861 secs. Crest Factor: 6.17 dB

Rec. Length: 0.74 secs

Power Timings Current Limits Voltage Mon. Data Reduction SSP Mon. Temp. Mon. Project Info Reporting

Time Units: minutes

Power Units: Watts

Power

Norm. Imp. 6.09 Ohms

Initial Power 75.00 Watts

Power Ramp

Final Power 0.00 Watts

Power Step 0 W

Step Every 0 mins.

Tone Burst

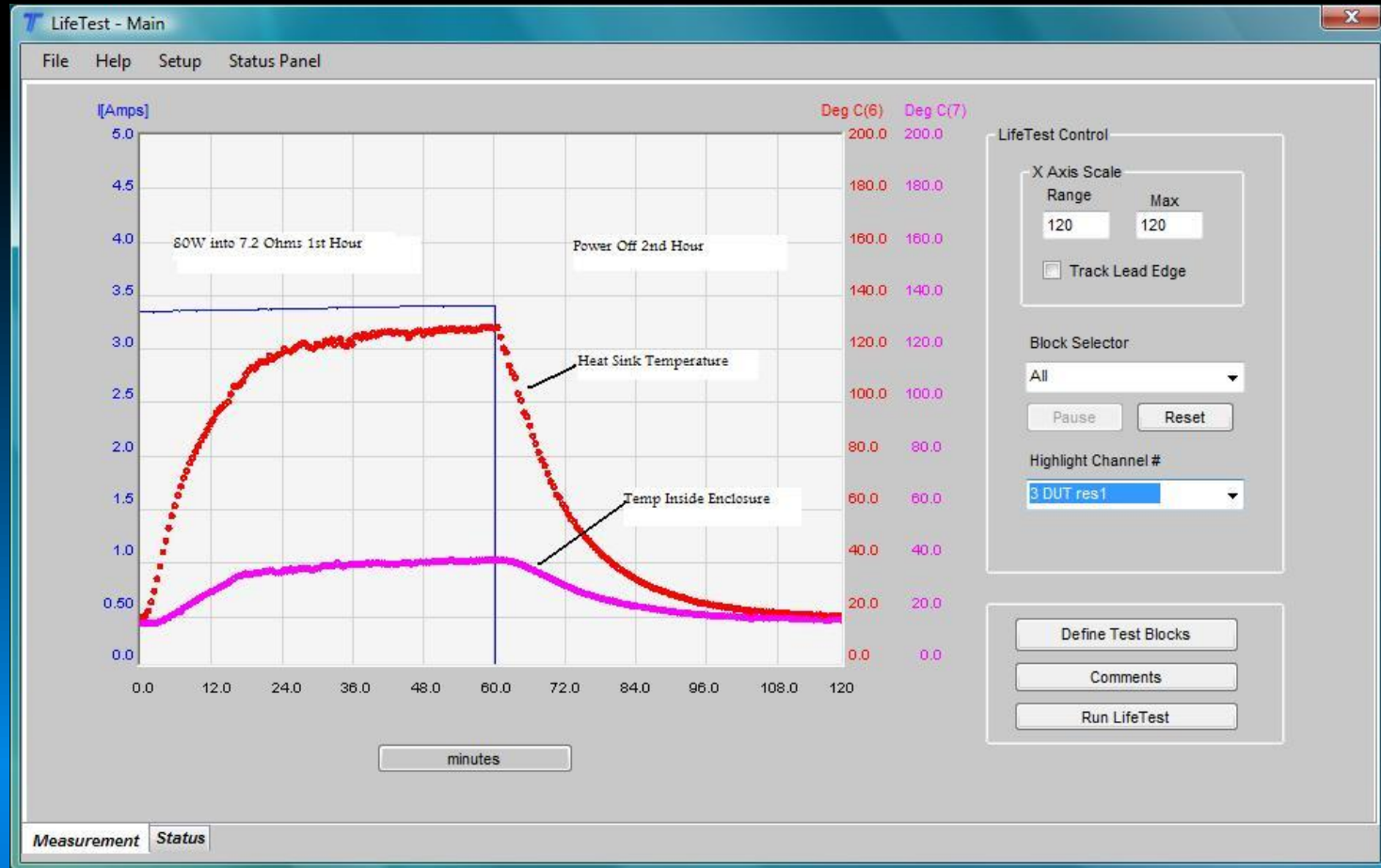
Tone Burst Peak Voltage 0 Vpeak

Select channels in the block of DUTs, enter voltage, test duration, signal type and it's ready to go

Every channel can have its own unique setting, or multiple channels can be grouped together in blocks



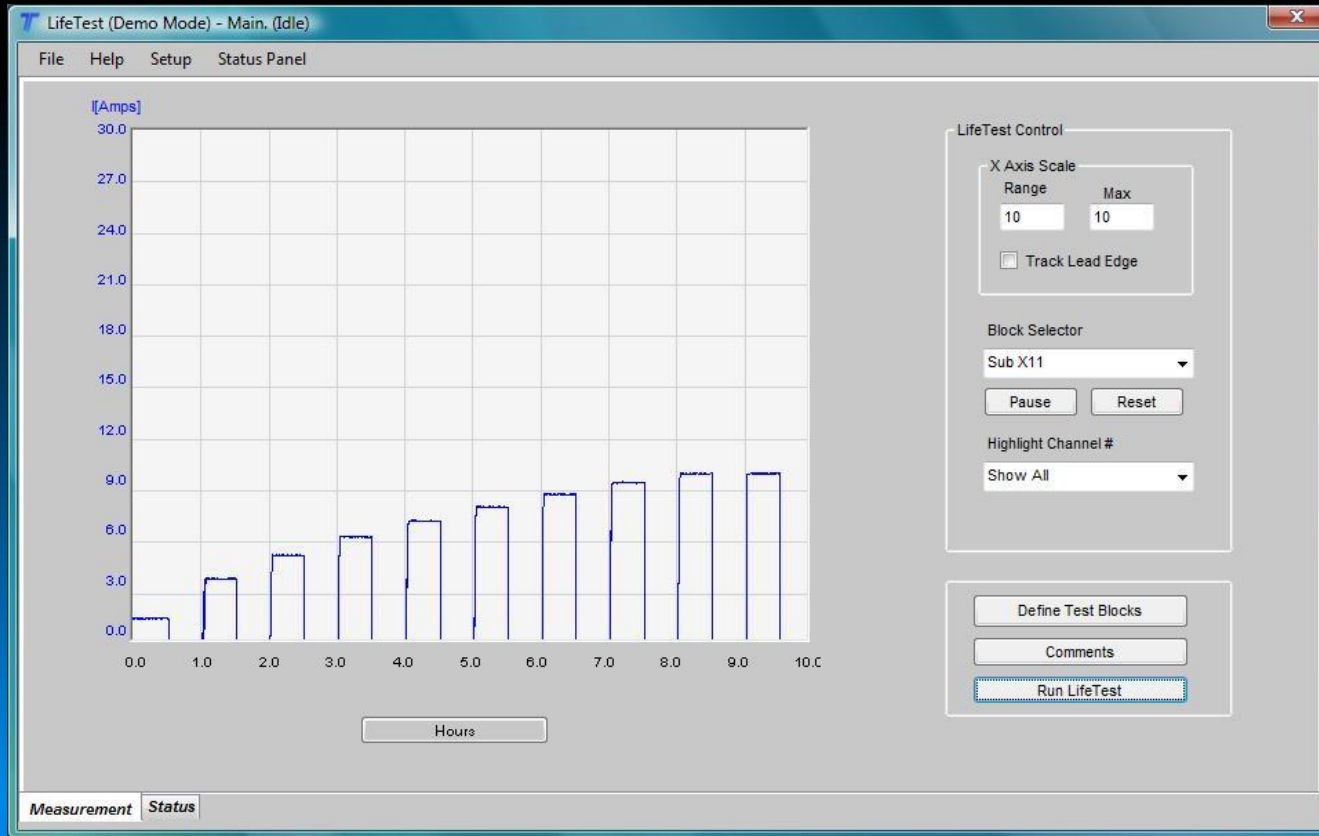
Temperature Monitoring



Power Amplifier Testing. Monitoring Current Flow and Temperature of Heat Sink and Enclosure Interior



Power Ramp With Duty Cycling



12" Woofer Power Ramp From 10 to 400 Watts in 50 Watt Steps. $\frac{1}{2}$ Hour Duty On and Cool Down Cycles



Auto Shut Down on DUT Failure

The screenshot displays the LifeTest software interface during a test run. The main window shows a graph of current flow over time for 8 channels. Channel 4 shows a sharp spike at approximately 24 minutes, and Channel 8 shows a drop to zero at approximately 48 minutes. Two callout boxes provide details for these failures.

LifeTest Status (Always On Top)

Chn #	1	2	3	4	5	6	7	8
Block #	1	1	1	1	1	1	1	1
Rem. Time [hrs.]	0.000	0.000	0.000	0.650	0.000	0.000	0.000	0.216
Voltage [Vrms]	0.00	0.00	0.00	19.98	0.00	0.00	0.00	20.00
[Amps]	4.98	4.93	4.78	9.00	4.84	4.67	4.91	0.00
Upper Limit [Amps]	5.61	5.47	5.33	5.61	5.47	5.33	5.61	5.47
Lower Limit [Amps]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Status	Done	Done	Done	SH	Done	Done	Done	OP

Channel Info

Channel #: 4 3121-1D
Block: Lot 3121
Test Signal: RS426B CFdB(dB)6.17.wav
Remaining Time: 3579.0 mins
Status: Fail/Short

Current Limits

Upper: 5.61 Amps
Lower: 1.00 Amps

Reset Channel

Reset from start
 Reset to last measurement time

Callouts:

- Channel 4 shut down on detected current spike indicating short circuit
- Channel 8 shut down when open circuit causes current flow to drop to zero

Annotations:

- Click the status button to get this screen and more information
- Restart test with current or new DUT - test timing is accurately

LifeTest Control

X Axis Scale: Range 60, Max 60
 Track Lead Edge

Block Selector: All
Pause, Reset

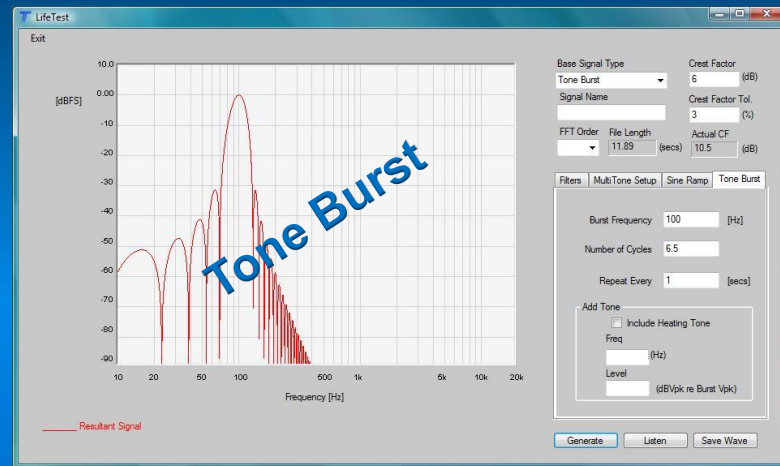
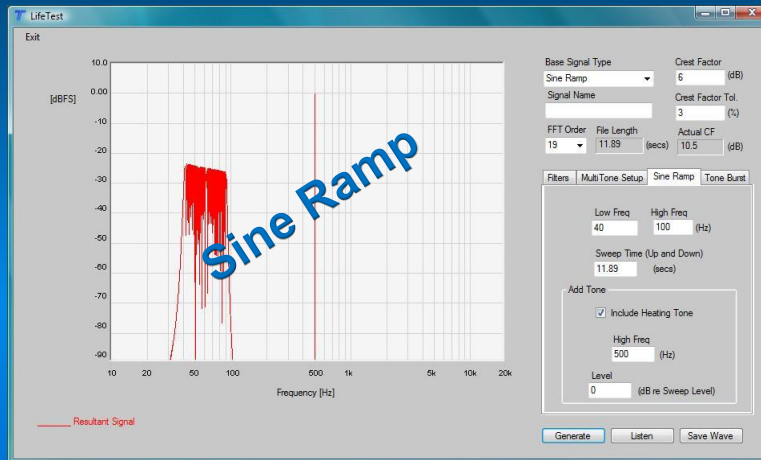
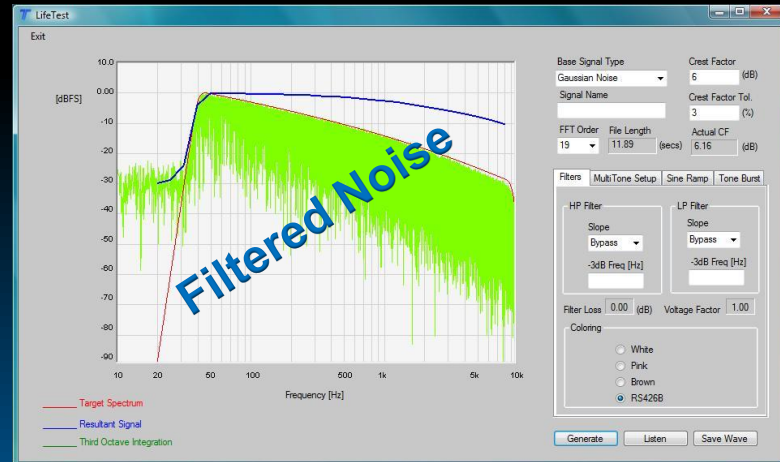
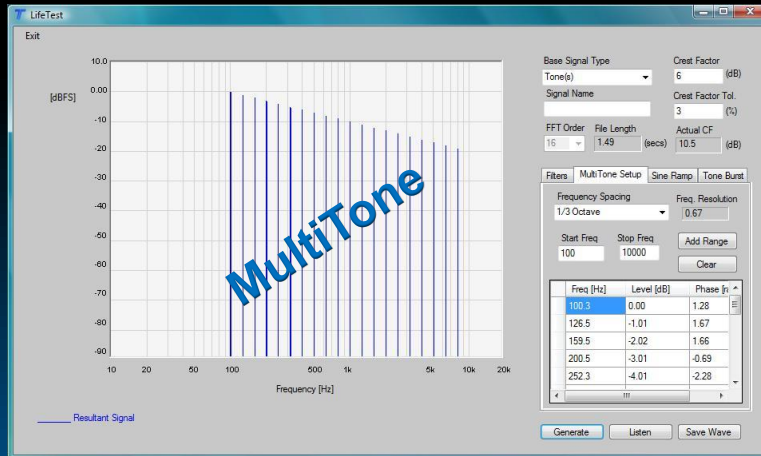
Highlight Channel #: Show All

Define Test Blocks, Comments, Run LifeTest

Testing 8 Woofers in a Single Block. 2 Channels Shut Down On Failure



Signal Generator Module



These Signals Created and Ready To Use In Just a Couple Minutes

Status Screens

LifeTest Status

Always On Top

Chn #	1	2	3	4	5	6	7	8
Block #	2	2	1	2	3	3	3	3
Rem. Time [hrs.]	3.822	3.822	0.772	3.822	51.322	51.322	51.322	51.322
Voltage [Vrms]	0.00	0.00	21.41	0.00	28.29	28.29	28.26	28.33
I[Amps]	0.00	0.00	3.52	0.00	3.58	3.50	3.56	3.54
Upper Limit [Amps]	0.00	0.00	30.00	0.00	0.00	0.00	0.00	0.00
Lower Limit [Amps]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Status	OK	OK	OK	OK	OK	OK	OK	OK

LifeTest DUT Comments

Exit

Ch#	DUT_ID	Comment
1	Sub X11-B1	Sample # 32-SW1. Extra glue on the leads
2	Sub X11-B2	Sample # 33-SW1. No extra glue on the leads
3	8" OEM Car Spkr	No signs of trouble after 75 hours
4	Sub X11-B3	Sample # 34-SW1. No extra glue on the leads
5	SN 123-1	Monthly testing - noted darkening voice coil after 45 hours
6	SN 123-2	Monthly testing
7	SN 123-3	Monthly testing - slight lead fray near terminals noted after 17 hours
8	SN 123-4	Monthly testing

LifeTest Sensor Moni...

Update Temp Units (deg C)

Sensor	Reading
3821 Heat Sink T	120.1 Deg C
Back Plate 1	35.4 Deg C
Back Plate 2	29.2 Deg C
Enclosure Temp	27.1 Deg C
Chamber 1 Temp	50.5 Deg C
Chamber 2 Temp	85.7 Deg C
Chamber 1 Humidi	55.0 %RH
Chamber 2 Humidi	85.0 %RH

Real Time Monitoring at the Test Station

LIFETEST

Remote Monitoring And Email Reports

This is a LifeTest Report from LT Station 1 BT Lab
5/7/2009 9:43:22 AM

Part Number: X21-3.1
Project: New Powered Subwoofer
Customer: N/A
Specification: SW-125W
Engineer: Mr. Mann
Test Signal: RS426B.wav
Test Duration: 2.0 hrs.
Power Profile: 1.0W (2.00Vrms)

Channel Status

- 1) Time Left:115.7 mins Power:125W
- 5) Time Left:115.7 mins Power:125W
- 6) Time Left:115.7 mins Power:125W
- 8) Time Left:115.7 mins Power:125W

ch#	Status	Test Station	BlockName	Rem. Time	Vrms	I[Amps]	Comments
3	OK/In ...	True Technologies LT Statio...	Demo With ...	44.567[m...	21.4	3.49	
1	OK/Du...	True Technologies LT Statio...	Sub X11	240[mins]	15.5	0.00	Sample # 32-SW1. Extra glue on the leads
2	OK/Du...	True Technologies LT Statio...	Sub X11	240[mins]	15.5	0.00	Sample # 33-SW1. No extra glue on the leads
4	OK/Du...	True Technologies LT Statio...	Sub X11	240[mins]	15.5	0.00	
5	OK/In ...	True Technologies LT Statio...	8 Inch PN 4...	51.293[s...	28.3	3.54	
6	OK/In ...	True Technologies LT Statio...	8 Inch PN 4...	51.293[s...	28.3	3.58	
7	OK/In ...	True Technologies LT Statio...	8 Inch PN 4...	51.293[s...	28.3	3.51	
8	OK/In ...	True Technologies LT Statio...	8 Inch PN 4...	51.293[s...	28.3	3.49	

Update Every 0.1 minutes Add Remote Monitor File Reset Monitor Files Always On Top

Remotely Monitor Your Test Status on
Multiple Systems Anywhere in the World



LIFETEST

LifeTest Hardware

Eight channel building blocks up to 24 channels each PC

Rack mounted, robust aluminum chassis

All connections neatly made on back panel

Easy installation with calibration in under 1 minute per channel



LifeTest – A Tool for the Entire Product Life Cycle

- New Product Development
- Reliability Testing
- Production Lot Validation
- Life Testing



LifeTest is Cost Effective

- Modular Implementation - 8, 16, and 24 Channel Options
- Runs on Basic PCs and Windows Operating Systems. Inexpensive Audio Interfaces Manage Signal I/O
- Up and Running With Very Little Time Investment
- Easy To Learn and Use by Engineers and Technicians



LifeTest is Cost Effective

- Eliminates External Noise Generators, Filters, Clipping Circuits, CD Players, Etc.
- Generation of Most Test Signals Requires Less Than 5 Minutes
- Data Archiving Makes It Easy to Find and Analyze Historical Test Data



Get A Quote

- Basic Package – LifeTest Software and Hardware, Audio Interface and Signal Cables
- Full Turnkey Systems Built To Your spec – Includes Amplifiers, Equipment Racks, Speaker Cables, etc. Let Us Know What You Need
- On-Site Installation and Training Packages Also Available



LifeTest Info

➤ Contact:

True Technologies

8309 West Ridge Drive

Pleasant Prairie, WI 53158 USA

+1-262-694-2573

rtrue@true-technologies.com

➤ Request The User Manual For More Detailed Information

