



923LTS Automated Loop Test System Specifications

923LTS Line Interface

Input	2-wire loop
Holding	≥ 100 ma 42.5 to 105 V DC open circuit voltage
DC Blocking	150 V DC
Balance	> 90 dB, 50–120 Hz, decreasing 6 dB/octave above 120 Hz
Termination	600 Ω or 900 Ω ; return loss ≥ 30 dB from 200–4000 Hz, ≥ 15 dB from 20–5000 Hz
Listen and Talk	Built-in speaker (standard) Talk capabilities (standard)
Return Loss Termination	600 Ω or 900 Ω ($\pm 1\%$) in series with 2.16 μ F ($\pm 3\%$) or custom termination
AC Impedance to Ground	1 MEG, tip or ring to ground
<u>DTMF Signaling</u>	
Frequency	$\pm 0.5\%$ of Bell standard frequencies
Level	-7.0 dBm0 per tone, accuracy ± 0.5 dB
Timing	50 ms on/off, accuracy 0.5 ms

AC and DC Measurements

DC Measurements

Range	-99 V DC to +99 V DC (with over-range indication)
Voltage Resolution	0.1 V DC
Voltage Accuracy	$\pm 2\%$ of reading, ± 0.3 V DC
DC Measurement Modes	Tip-to-ring, tip-to-ground, ring-to-ground

Tip-to-Ring Current

Range	± 100 mA
Resolution	1 mA DC
Accuracy	$\pm 2\%$ of reading, ± 1 mA DC

AC Measurements

Voltage Range	0–150 V rms
Voltage Resolution	1 V rms
Voltage Accuracy	$\pm 2\%$ of reading, ± 0.5 V rms
Frequency Range	15–120 Hz

Frequency Resolution	1 Hz
Frequency Accuracy	±1 Hz
Ring Detect	33 V rms ±7 V, 20–60 Hz
Termination	(1 REN) resistor in series with capacitor
Isolation	Tip, ring, and station ground are isolated from data interface connector, charging connector, and case by more than 500 volts.

Send/Receive Performance

Send

Frequency Range	50–5000 Hz
Resolution	1 Hz
Accuracy	±0.5 Hz
Level Range	-40 to +10 dBm
Resolution	0.1 dB
Level Accuracy	1000 Hz ±0.1 dB, -19 to 0 dBm 50–5000 Hz ±0.2 dB, -40 to +10 dBm
Distortion (THD)	1 kHz 70 dB, 0 dBm 200–3700 Hz -60 dB, -16 to 0 dBm 100–5000 Hz -50 dB, -40 to +10 dBm

Receive

Frequency Range	20–5000 Hz
Resolution	1 Hz
Accuracy	±1 Hz
Level Range	-50 to +10 dBm
Resolution	0.1 dB
Level Accuracy (terminated)	1000–1020 Hz ±0.1 dB, -19 to 0 dBm 200–5000 Hz ±0.2 dB, -50 to +10 dBm 20–200 Hz ±0.5 dB, -50 to +10 dBm

Noise

Level Range	10–100 dBm
Resolution	1 dB
Level Accuracy	±1 dB 20–100 dBm; 6 dB 10–20 dBm
Filters	C-message, C-notch, 3-kHz flat

Noise-to-Ground

Level Range	40–130 dBm
Resolution	1 dB
Level Accuracy	±1 dB 55–130 dBm; 6 dB 40–55 dBm
Filters	C-message, C-notch, 3-kHz flat

Tests

3-Tone Gain Slope

Frequency	Programmable 50–5000 Hz
Level	-40 to 0 dBm
Loss	-2.0 dB to +20.0 dB
Accuracy	±0.2 dB

C-Message Noise

Range	10–90 dBrnC
Accuracy	±1 dB

C-Notch Noise

Frequency	1020 Hz
Holding Tone	-40 to 0 dBm
Range	20–70 dBrnC
Accuracy	±1 dB

Return Loss

Bands	ERL, SRL High, and SRL Low
Level	-40 to 0 dBm
Range	0–40.0 dB
Accuracy	±1 dB

3kHz Flat Noise

Range	20–90 dBrnC
Accuracy	±1 dB
Filter	3 kHz flat

Phase and Amplitude Jitter

(standard and low frequency)

Frequency	1020 Hz
Level	-40 to 0 dBm
Filters	20–300 Hz or 4–300 Hz
Range	0–20.0% amplitude, 0°–20.0° phase
Accuracy	±5% of reading, ±0.2

Impulse Noise, Hits, and Dropouts

Frequency	1020 Hz
Level	-40 to 0 dBm
Threshold	50–90 dBrnC
Spread	1–9 dB (±1 dB)
Phase Hit Threshold	5°–30° (±10%, ±0.5°)
Gain Hit Threshold	1–8 dB (±0.5 dB)
Dropout Threshold	-12dB
Test Length	1–99 minutes (each way)
Range	0–999 impulses/hits
Accuracy	±1 impulse/hit

23-Tone Test

Transmitter

Composite Level	-40 to 0 dBm
Individual Tones	Level -13.6 dB below composite level
	Flatness ± 0.2 dB
	Frequencies 203.125–3640.625 Hz in 156.25 Hz steps, ± 10 ppm
	Phase per IEEE 743 $\pm 0.25^\circ$
	Peak to RMS Ratio 8.79

Receiver

Range	-40 dBm to -6 dBm
Accuracy	± 0.2 dB

Envelope Delay Distortion

Accuracy	± 10 μ s
Range	0–10,000 μ s
Frequencies	281.15–3562.5 Hz in 156.25 Hz steps

Signal-to-Noise

± 2 dB from 10–24 dB
± 1 dB from 25–40 dB
± 2 dB from 41–45 dB

Signal-to-Total Distortion

± 2 dB from 10–24 dB
± 1 dB from 25–40 dB
± 2 dB from 41–45 dB

Intermodulation Distortion

(2nd and 3rd order)	± 2 dB from 20–29 dB
	± 1 dB from 30–46 dB
	± 2 dB from 47–55 dB
	± 3 dB from 56–60 dB

PSQM

Send

Artificial voice	per ITU-T P.50
Level	-20 dBm
Genders	male and female

Receive

PSQM	0–6.5 ± 0.2
MOS	1–5 ± 0.2
Loss	0 to -20dB

100 Responder Noise Measurement

C-Message Noise

Range 10–90 dBrnC

Accuracy ±1 dB

3kHz Flat Noise

Range 20–90 dBrnC

Accuracy ±1 dB

Return Loss

Range 0–40 dBm

Accuracy ±1 dB

102 Responder Loss Measurement

Level

Range -40–0 dBm

Accuracy ±0.2 dB

C-Notch Noise

Range -40–0 dBm

Accuracy ±0.2 dB

Signal to Noise

Range 10–50 dB

Accuracy ±1 dB

General 923LTS

Weight	Approximately 20 oz.
Size	Approximately 1.5" high x 4" wide x 9" long
Temperature	Operating 0° to 50° C Storage -20° to +60° C
Humidity	85% noncondensing
Serial Data Input/Output	1200; 9600; 38,400 and 115,200 bps
Power	120 V AC, 60 Hz or battery

