

Provided by:



Lease • Sales • Calibration • Service

www.atecorp.com
(800) 404-ATEC

DATA SHEET

FieldFox Handheld Analyzers

4/6.5/9/14/18/26.5/32/44/50 GHz

- | | | |
|--------|--------|--------|
| N9913A | | |
| N9914A | | |
| N9915A | N9925A | N9935A |
| N9916A | N9926A | N9936A |
| N9917A | N9927A | N9937A |
| N9918A | N9928A | N9938A |
| N9950A | | N9960A |
| N9951A | | N9961A |
| N9952A | | N9962A |



Cable and Antenna Analyzer and Vector Network Analyzer

The performance listed in this section applies to the cable and antenna analyzer (referred to as CAT) and vector network analyzer (VNA) capabilities available in the following models:

FieldFox RF & microwave (combination) analyzers:	N9913A, N9914A, N9915A, N9916A, N9917A, N9918A N9950A, N9951A, N9952A
FieldFox microwave vector network analyzers:	N9925A, N9926A, N9927A, N9928A

NOTE: Combination analyzers = Cable and antenna tester (CAT) + Vector network analyzer (VNA) + Spectrum analyzer (SA)

Frequency specifications

	Models	Frequency range
N991xA, N992xA	N9913A	30 kHz to 4 GHz
	N9914A	30 kHz to 6.5 GHz
	N9915A, N9925A	30 kHz to 9 GHz
	N9916A, N9926A	30 kHz to 14 GHz
	N9917A, N9927A	30 kHz to 18 GHz
	N9918A, N9928A	30 kHz to 26.5 GHz
N995xA	N9950A	300 kHz to 32 GHz
	N9951A	300 kHz to 44 GHz
	N9952A	300 kHz to 50 GHz
Frequency reference, -10 to 55°C		
Accuracy	± 0.7 ppm (spec) + aging	
	± 0.4 ppm (typical) + aging	
Accuracy, when locked to GPS	± 0.010 ppm (spec)	
Accuracy, when GPS antenna is disconnected	± 0.2 ppm (nominal) ¹	
Aging Rate	± 1 ppm/yr for 20 years (spec), will not exceed ± 3.5 ppm	
Frequency resolution		
	Spec	
Frequency ≤ 5 GHz	1 Hz	
Frequency ≤ 10 GHz	1.34 Hz	
Frequency ≤ 20 GHz	2.68 Hz	
Frequency ≤ 40 GHz	5.36 Hz	
Frequency ≤ 50 GHz	8.04 Hz	
Data points or resolution		
101, 201, 401, 601, 801, 1001, 1601, 4001, 10,001 Arbitrary number of points settable through front panel and SCPI		
IF bandwidth²	N991xA, N992xA	N995xA
	3 Hz, 10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz	10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz
System impedance		
50 Ω (nominal), 75 Ω with appropriate adapter and calibration kit		

¹ The maximum drift expected in the frequency reference applicable when the ambient temperature changes $\pm 5^\circ\text{C}$ from the temperature when the GPS signal was last connected.

² VNA mode only. Recommend using averaging in CAT mode.

Cable and Antenna Analyzer and Vector Network Analyzer (Continued)

Test port output specifications

High power in N991xA and N992xA refers to the target output power level of the analyzer when the *Power Setting* is set to *High*. As an example, if you have a frequency sweep from 3 to 6.5 GHz, the analyzer will achieve the power level of -1 dBm across the band.

Low power level for N991xA and N992xA analyzers is a flat -45 dBm across the whole frequency band and is the output of the analyzer when the *Power Setting* is set to *Low*.

High power in the N995xA refers to the target output power level of the analyzer when the *Power Setting* is set to *High*. As an example, if you have a frequency sweep from 39 to 46 GHz, the analyzer will achieve the power level of -2 dBm across the band.

Low power level for N995xA analyzers is the lowest power level that can be set and is the output of the analyzer when the *Power Setting* is set to *Low*.

Max leveled power in the N995xA refers to the maximum leveled (flattened) power that can be achieved across the designated frequency range. For example, if you have a frequency sweep from 32 to 44 GHz and set up the analyzer to measure all four S-parameters, needing both ports 1 and 2, the maximum power the analyzer can be set to is -6 dBm.

Test port output power (dBm), high power	Typical	Nominal
N991xA, N992xA	Port 1 or Port 2	Port 1 or Port 2
30 to 300 kHz	-11	—
> 300 kHz to 2 MHz	-3	-2
> 2 to 625 MHz	-2	-1
> 625 MHz to 3 GHz	1	3
> 3 to 6.5 GHz	-1	1
> 6.5 to 9 GHz	-2	0
> 9 to 14 GHz	-4	-2.5
> 14 to 18 GHz	-6	-4.5
> 18 to 23 GHz	-10	-8.5
> 23 to 26.5 GHz	-12	-11
Test port output power (dBm), low power	Typical	Nominal
N991xA, N992xA	Port 1 or Port 2	Port 1 or Port 2
30 kHz to 26.5 GHz	—	-45 (flattened)

Cable and Antenna Analyzer and Vector Network Analyzer (Continued)

System performance specifications

System dynamic range ^{1,2} (dB), high power, 300 Hz IFBW, 100 point average, Port 1 or Port 2 (-10 to 55 °C)			
	Frequency	Spec	Typical
N991xA, N992xA	> 300 kHz to 9 GHz ³	95	100
	> 9 to 14 GHz	91	97
	> 14 to 18 GHz	90	94
	> 18 to 20 GHz	87	90
	> 20 to 25 GHz	74	79
	> 25 to 26.5 GHz	65	70
N995xA	> 300 kHz to 1 MHz	—	70 (nominal)
	> 1 to 10 MHz	—	100 (nominal)
	> 10 MHz to 20 GHz ⁴	100	110
	> 20 to 44 GHz ⁵	90	100
	> 44 to 50 GHz ⁶	81	90
Measurement stability over temperature		Nominal	
	Frequency	Magnitude (dB/°C)	Phase (deg/°C)
N991xA, N992xA	≤ 15 GHz	± 0.018	—
	> 15 to 26.5 GHz	± 0.080	—
N995xA	≤ 15 GHz	± 0.005	± 0.1
	≤ 25 GHz	± 0.030	± 0.3
	> 25 GHz	± 0.060	± 0.6
Measurement speed (Sweep time)			
CAT		N991xA, N992xA	N995xA
	Return loss, 30 kHz to 26.5 GHz, 1-port cal, 1001 points ⁷	673 μs /pt	—
	Return loss, 300 kHz to 50 GHz, 1-port cal, 1001 points	—	686 μs /pt
	Distance-to-fault, 100-meter cable, 1-port cal, 1001 points ⁷	782 μs /pt	760 μs /pt
VNA		N991xA, N992xA	N995xA
	S11 and S21, 30 kHz to 26.5 GHz, enhanced response cal, 100 kHz IF bandwidth, 1001 points ⁸	432 μs /pt	—
	S11 and S21, 300 kHz to 50 GHz, enhanced response cal, 100 kHz IF bandwidth, 1001 points	—	478 μs /pt

¹ System dynamic range is measured in the factory with loads on the test ports after a thru normalization.

² For CAT mode, "Insertion loss (2-port)", decrease listed dynamic range specifications by 20 dB, as CAT mode IFBW is fixed at 10 kHz. Can obtain full dynamic range by using S21 measurement in VNA mode with 100 Hz IFBW.

³ < 300 kHz: 63 dB nominal; 2 to 9 MHz: 85 dB spec, 90 dB typical.

⁴ Decrease by 3 dB from 15 to 15.8 GHz for S21.

⁵ Decrease by 5 dB from 21.7 to 22.1 GHz for S21.

⁶ Decrease by 4 dB from 44 to 50 GHz for S21.

⁷ 850 μs /pt; slower speed applicable to FieldFox models with serial number prefix ≤ MY5607/SG5607/US5607 and FieldFox models not upgraded with the fast CPU Option N9910HU-100/200/300.

⁸ 850 μs /pt; slower speed applicable to FieldFox models with serial number prefix ≤ MY5607/SG5607/US5607 and FieldFox models not upgraded with the fast CPU Option N9910HU-100/200/300.

Cable and Antenna Analyzer and Vector Network Analyzer (Continued)

Test port input specifications

Trace noise ¹ , high power, 300 Hz IFBW, Port 1 or Port 2		Spec (-10 to 55°C)	
	Frequency	Magnitude (dB rms)	Phase (deg rms)
N991xA, N992xA, N995xA	> 300 kHz to 20 GHz ²	0.004	0.07
	> 20 to 26.5 GHz	0.007	0.14
	> 26.5 to 30 GHz	0.007	0.14
	> 30 to 50 GHz	0.008	0.22
Receiver compression		Typical	
	Frequency	Port 1 or Port 2	
N991xA, N992xA	500 MHz to 1 GHz	+10 dBm, 0.15 dB compression	
	> 1 to 26.5 GHz	+10 dBm, 0.10 dB compression	
N995xA	2 MHz to 50 GHz	+5 dBm, 0.10 dB compression	
Maximum input level		Port 1 or Port 2	
	Average CW power	DC	
N991xA, N992xA	+27 dBm, 0.5 watts	± 50 VDC	
N995xA	+25 dBm, 0.3 watts	± 40 VDC	
Immunity to interfering signals		Nominal	
		+16 dBm	

CAT and VNA measurements

CAT mode	
CAT measurements	Distance-to-fault (dB) Return loss (dB) Return loss and DTF (dB) VSWR Distance-to-fault (VSWR) Cable loss (1-port) Insertion loss (2-port) (requires option 211) Distance-to-fault (Lin) TDR (Lin rho) (requires option 215) TDR (ohm) (requires option 215) TDR & DTF (requires option 215)
Distance-to-fault (DTF) settings	
Frequency/distance	Start distance, stop distance
Sweep time	Units: meters or feet (Can also be set as Preferences)
Frequency mode	Bandpass, lowpass
CAT mode averaging	Set sweep time in seconds

¹ For CAT mode, increase trace noise by a factor of 5.7, as CAT mode IFBW is fixed at 10 kHz. Can use averaging in CAT mode to reduce trace noise or use VNA mode with 300 Hz IFBW.

² Excludes multiples of 390 kHz.