

## JD7106A RF Analyzer



### Key Features

#### Multi-function Integration

The JD7106A has integrated all the necessary functions to test and measure modern RF communication systems. Its combined functionality includes spectrum analysis, interference analysis, cable and antenna analysis, and power meter.

#### Easy-to-use User Interface

A common interface through its multiple functions provides the same menu structure that is easy to learn and use. It allows a quick configuration set for complicated radio systems, making a single button action to properly configure the instrument.

#### Compact and Lightweight Design

The JD7106A is a compact and portable solution for users to perform outdoor maintenance jobs. The built-in high capacity Li-ion battery allows jobs at remote sites without being restricted by power cord.

### Introduction

The JD7106A is a RF Analyzer for installation and maintenance of modern RF communication system and the acceptance, installation, and troubleshooting of antenna and cable infrastructure. It combines the functionality of spectrum analysis, interference analysis, cable and antenna analysis, and power measurements.

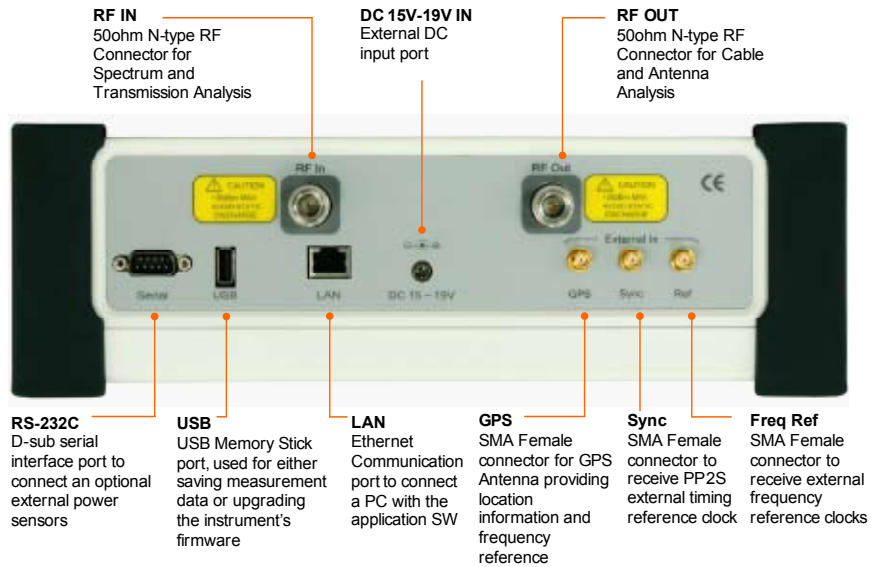
The JD7106A offers the full scope of common RF performance measurements such as channel power, adjacent channel power, occupied bandwidth, return loss, tower mounted amplifier's gain and distance to fault location.

In addition, the JD7106A provides an Interference Analysis function which presents a spectrogram that shows RF activity through time, detailing differences in frequency and spectral power, identifying unwanted interference by other sources.

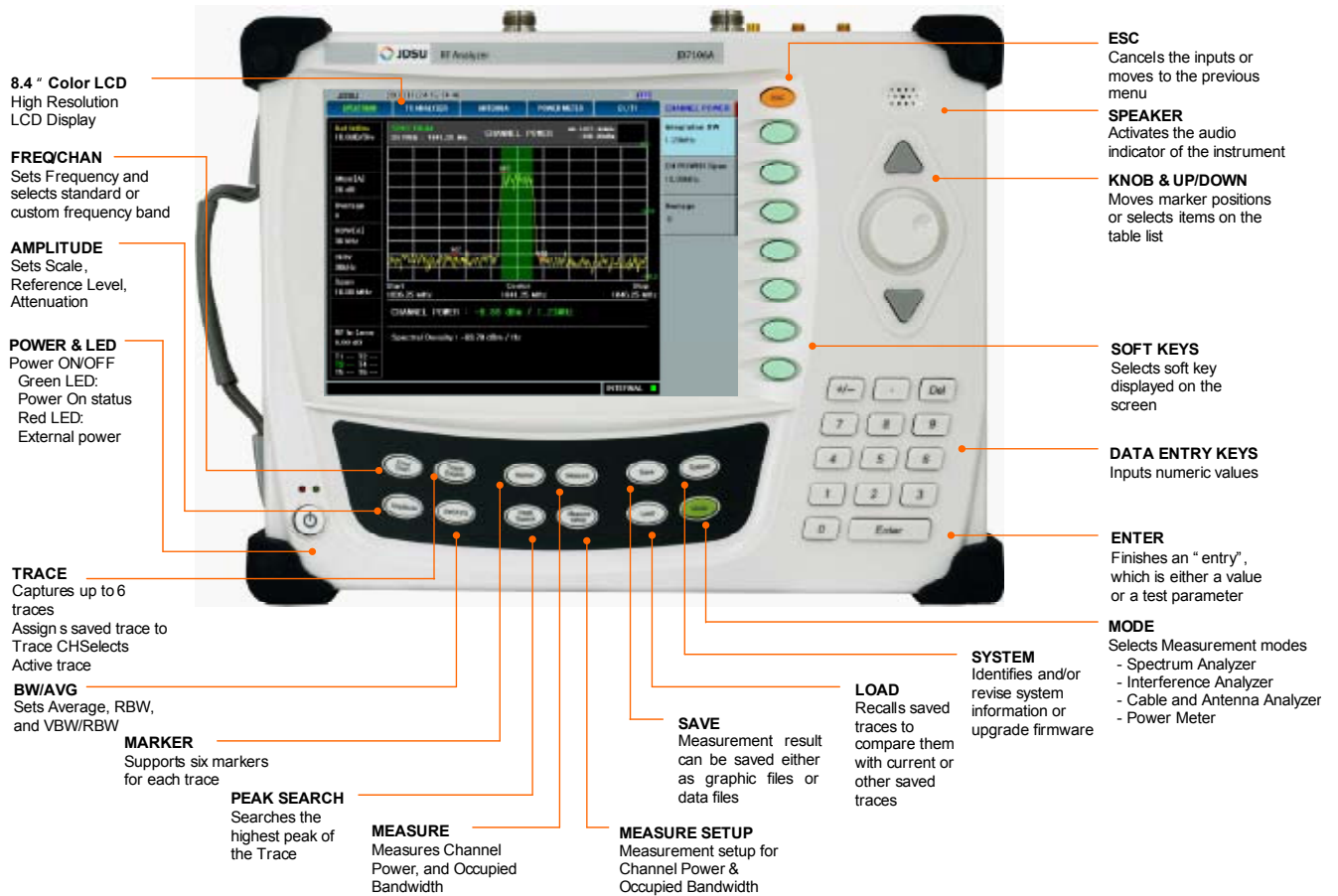
The JD7106A is the perfect field testing solution that combines portability, due to its lightweight design and battery extended operation, and performance, with its multifunction capability and high resolution display.

The JD7106A is the optimal solution for installation and maintenance of RF communications systems as well as verification of RF emissions.

Top view



Front view

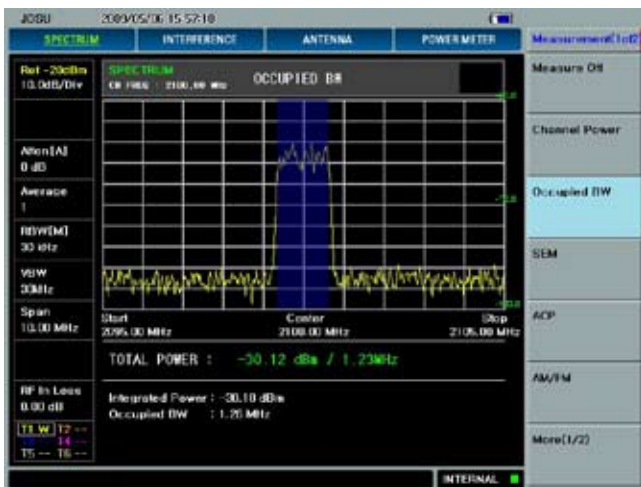
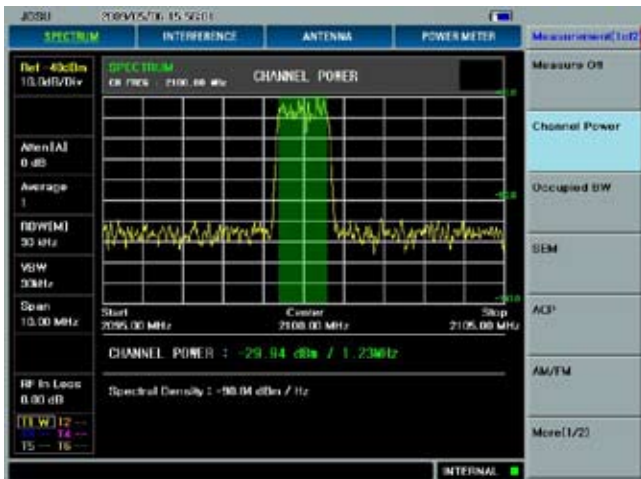


# Main Functions

## Spectrum Analyzer

The RF Analyzer has a general purposed spectrum analyzer which is the most flexible test tool for RF analysis. Beyond this basic spectrum analysis functionality, a built in RF measurement application provides a single button RF power measurements including:

- Channel Power
- Adjacent Channel Power
- Spectrum Emission Mask
- Occupied Bandwidth
- RF Source
- AM/FM Audio Demodulation



## Antenna/Cable Analyzer

The RF Analyzer can perform also the function of an antenna and cable analyzer that measures cable loss, distance to fault (DTF) and Voltage Standing Wave Ratio (VSWR).

The antenna and cable analysis functionality can characterize active and passive devices such as cables, filters, amplifiers, antennas and multiplexers.

In one port measurement, users can measure feed-line cable loss, DTF location, and Antenna VSWR.

And with two ports measurements users can perform gain measurements, insertion loss, and isolation; particularly useful for filters, amplifiers, Tower Mounted Amplifiers (TMA), RF path gain, and antenna isolation.



4

**Power Meter**

The RF Analyzer can perform two power testing methodologies:

- Internal, for standard power measurements without the assistance of external power sensors.
- External, for high accuracy power measurements with the assistance of external power sensors.

The internal power meter, with no additional power sensors, uses the spectrum analyzer functionality. It is a simple test methodology with reasonable accuracy. On the other hand, external power sensors perform power measurements more accurately.

The RF Analyzer can be equipped with a Terminating Power Sensor or with a Directional Power Sensor (through-line) which has the advantage to minimize service disruption and covers an ultra-wide power range.

- Power displays are in either dBm or Watts.
- Upper or lower limit can be set for Pass/Fail indication.

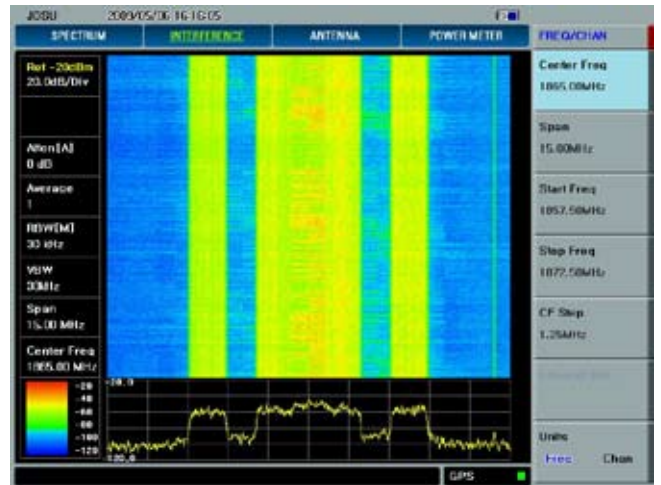


**Interference Analyzer**

The RF Analyzer has an interference analyzer function which is the most effective way to identify periodic or intermittent RF interference.

A spectrogram display allows the user to capture spectrum activity while displaying frequency, power and time information.

The signal tracking capability is particularly useful for observing signal strength at a single frequency over time with an audible indication.



## 5

## Specifications

## Standard

Frequency accuracy	± 0.05 ppm internal
Frequency aging	± 0.5 ppm/year
Display	8.4" TFT LCD (800 x 600 mode)

## Frequency and time reference

Even second	TTL
10 MHz, 13 MHz, 15 MHz	-10 ~ +10 dBm

## Spectrum Analyzer

Input frequency range	100 kHz ~ 3 GHz
Maximum input level	+30 dBm (1 W)
Amplitude accuracy	± 1.0 dB
Resolution bandwidth	10 Hz ~ 1 MHz (1-3 sequence)
Video bandwidth	1 Hz ~ 1 MHz (1-3 sequence)
Dynamic range	> 85 dB
Input attenuation	0 ~ 55 dB (step 5 dB)
SSB phase noise	-95 dBc/Hz @ 30 kHz offset -105 dBc/Hz @ 100 kHz offset

DANL	Typical -140 dBm	
	@100 Hz RBW with preamp on	
	Frequency	Typical Max
	10 MHz ~ 1 GHz	-140 dBm -142 dBm
	1 GHz ~ 2 GHz	-138 dBm -140 dBm
	2 GHz ~ 3 GHz	-138 dBm -138 dBm

Measurement range	DANL ~ +30 dBm
RF in VSWR	<1.5

## Power Meter

Frequency range	100 kHz ~ 3 GHz
Display	± 100 dBm (user settable)
Measurement range	-70 dBm ~ +30 dBm
Offset range	0 ~ 60 dB
Accuracy	-40 dBm ≤ Power ≤ +30 dBm ± 1.0 dB -70 dBm ≤ Power < -40 dBm ± 1.5 dB
VSWR	< 1.5
Maximum power	+30 dBm (1 W) without external attenuator

## Cable and Antenna Analyzer

Max input power (RF out)	+25 dBm, ± 50 VDC
Frequency range	25 MHz ~ 4 GHz
Frequency resolution	100 kHz
Data points	126, 251, 501, 1001
Measurement speed	1, 1.3, 2.5, 5 s for each data point
One port power	0 dBm (nominal)
Corrected directivity	40 dB (typical)
1port accuracy	≤ ± (0.8 +  20 log (1 + 10 <sup>-EP/20</sup> ) ) dB (typical) EP = Directivity-measured return loss
Immunity to interference	On frequency: +5 dBm On channel: +17 dBm

## VSWR

Range	1 ~ 65
Resolution	0.01

## Return loss

Range	0 ~ 60 dB
Resolution	0.01 dB

## DTF (Distance To Fault)

Vertical range	VSWR: 1 ~ 65 Return loss: 0 ~ 60 dB
Vertical resolution	0.01
Distance	0 ~ 1250 m (4125 ft)
Horizontal range	0 to (# of data points-1) x horizontal resolution
Horizontal resolution	(1.5 × 10 <sup>6</sup> )(V <sub>p</sub> )/(Delta) × 0.95 V <sub>p</sub> : Cable's relative propagation velocity Delta [Hz] = stop freq – start freq

## Cable Loss

Range	0 ~ 30 dB
Resolution	0.01 dB

## Gain/Loss Measurement (optional)

Frequency range	25 MHz ~ 3 GHz
Frequency resolution	100 kHz
Output power level	-30 dBm or 0 dBm (typical)
Dynamic range	-80 dB ~ 60 dB

## 6

## Specifications

## High Accuracy Power Meter

## (Requires Optional Directional/Terminating Power Sensor)

Display range	-80 ~ +120 dBm
Offset range	0 ~ +60 dB
Resolution	0.01 dB or 0.1 xW

## Directional Power Sensors (optional)

## JD731A

Sensor type	Average and Peak
Frequency range	300 ~ 3800 MHz
Power range	Average: 0.15 W ~ 150 W (21.76 ~ 51.76 dBm) Peak: 4W ~ 400 W (36.02 ~ 56.02 dBm)
Measurement uncertainty	± 4% of reading + 0.05 W <sup>1,2</sup>
Input return loss	≤ 2500 MHz, 27 dBm min >2500 MHz, 25 dB
Directivity	27 dB min
Insertion loss	<1 GHz, <0.05 dB 1 ~ 2 GHz, <0.1 dB, 2 ~ 3 GHz <0.13 dB
Connector type	N-female on both ends

## JD733A

Sensor type	Average and Peak
Frequency range	150 ~ 3500 MHz
Power range	Average: 0.25 W ~ 20 W (24 ~ 43 dBm) Peak: 0.25 W ~ 20 W (24 ~ 43 dBm)
Measurement uncertainty	± 4% of reading + 0.05 W <sup>1,2</sup>
Input return loss	≤ 2500 MHz, 27 dBm min >2500 MHz, 25 dB
Directivity	27 dB min
Insertion loss	<1 GHz, <0.05 dB 1 ~ 2 GHz, <0.1 dB, 2 ~ 3 GHz <0.13 dB
Connector type	N-female on both ends

## Terminating Power Sensor (Optional)

## JD732A, JD734A, JD736A

Sensor type	Average (JD732A) Peak (JD734A) Average and Peak (JD736A)
Frequency range	20 MHz ~ 3800 MHz
Power range	-30 ~ +20 dBm (1 μW ~ 100 mW)
Measurement uncertainty	± 7% of reading <sup>1,2</sup>
Connector type	N-male

## General

## Interface Ports

Serial	1 Port
USB 1.1	1 Port
10 Mbps LAN	1 Port
GPS antenna (SMA)	1 Port
Built-in speaker	

## Battery (Lithium Ion)

Nominal voltage	11.1 V
Normal capacity	7200 mA
Minimum charge voltage	12.6 V
Battery operation time	1.5 hours at full charge

## External Reference Clock

## 10, 13, 15 MHz External Reference

Input power	-10 ~ +10 dBm
Connector type	SMA

## Environmental Condition

Operating temperature	-5°C ~ 50°C (23°F ~ 122°F)
Storage temperature	-20°C ~ 70°C (-4°F ~ 158°F)
Calibration cycle	1 year

## Dimension

Weight	5.6 kg (12.1 lbs) (including battery)
Size (W x H x D)	315 x 245 x 95 mm (12.4" x 9.6" x 3.7")

## Power Supply

AC input	100 ~ 240 V 2.5 A, 50 ~ 60 Hz
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Specification and product description subject to change without notice

<sup>1</sup> Specification is provided at a temperature 25°C ± 10°C

<sup>2</sup> CW condition

## Ordering information

### Mainframe

JD7106A	RF Analyzer incl. Spectrum Analyzer, Power Meter, Cable and Antenna Analyzer
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### Options

JD7106A001	Frequency Extension up to 3.7 GHz
JD7106A003	Gain/Loss Measurement
JD7106A004	GPS Receiver
JD7106A005	Interference Analyzer (recommended G700050351 ~ 5 and /or G700050361 ~ 3)
G700050351	400 ~ 450 MHz Omni RF Antenna <sup>1)</sup>
G700050352	450 ~ 500 MHz Omni RF Antenna <sup>1)</sup>
G700050353	806 ~ 894 MHz Omni RF Antenna <sup>1)</sup>
G700050354	870 ~ 960 MHz Omni RF Antenna <sup>1)</sup>
G700050355	1710 ~ 2170 MHz Omni RF Antenna <sup>1)</sup>
G700050361	806 ~ 866 MHz Yaggi RF Antenna <sup>1)</sup>
G700050362	824 ~ 894 MHz Yaggi RF Antenna <sup>1)</sup>
G700050363	1750 ~ 2390 MHz Yaggi RF Antenna <sup>1)</sup>

<sup>1)</sup> Required for interference measurement (option 005)

### Standard Accessories

Soft carrying case
AC-DC adapter
Cross LAN cable (1.5 m)
1 GB USB Memory
Lithium-Ion battery
Stylus pen
User's manual and application software CD
2 years warranty

### Optional Accessories

JD72450509	Calibration kit 40 dB, 4 GHz, 50 Ω, N(m) Type
JD72450510	Calibration kit 40 dB, 4 GHz, 50 Ω, DIN(m) Type
G710050571	Adapter N(m) to DIN(f), DC to 4 GHz, 50 Ω
G710050572	Adapter DIN(m) to DIN(m), DC to 4 GHz, 50 Ω
G710050573	Adapter N(m) to SMA(f), DC to 18 GHz, 50 Ω
G710050574	Adapter N(m) to BNC(f), DC to 1.5 GHz, 50 Ω
G710550342	Hard carrying case
G710650362	User's manual – printed version
GC71066000	Warranty extension of 1 year for Asia, North America
GC71066001	Warranty extension of 1 year for Latin America, EMEA

**Ordering information**
**High Accuracy Power Meters Accessories**

JD731A	Directional Power Sensor (300 MHz ~ 3800 MHz, average power 0.15 W, peak power 4 ~ 400 W)
JD733A	Directional Power Sensor (150 ~ 3500 MHz, average/peak 0.25 ~ 20 W)
JD732A	Terminating average power sensor (20 ~3800 MHz, -30 ~ +20 dBm)
JD734A	Terminating peak power sensor (20 ~ 3800 MHz, -30 ~ +20 dBm)
JD736A	Terminating dual mode (average/peak) power sensor (20~ 3800 MHz, -30 ~ +20 dBm)
G710050581	Attenuator 40 dB, 100 W, DC to 4 GHz (unidirectional)

**Test & Measurement Regional Sales**

<b>NORTH AMERICA</b> TEL: +1 866 228 3762 FAX: +1 301 353 9216	<b>LATIN AMERICA</b> TEL: +1 954 688-5660 FAX: +1 954 3454668	<b>ASIA PACIFIC</b> TEL: +852 2892 0990 FAX: +852 2892 0770	<b>EMEA</b> TEL: +49 7121 86 2222 FAX: +49 7121 86 1222	<a href="http://www.jdsu.com/test">www.jdsu.com/test</a>
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