JD725A

Cable and Antenna Analyzer - Dual Port

Key Features

- Portable and lightweight handheld instrument
- Built-in wireless frequency bands as well as the most commonly used RF cable types
- Touch-screen 7" TFT color display
- Superior immunity to RF interferences
- Up to 1001 data points for high resolutions and long distance problem location
- USB port, allowing external USB memory device
- Saves up to 400 measurement traces
- Saves up to 100 measurement screens
- Saves up to 20 user definable setups
- Interface with application software, JDViewer, for data management and report creation
- On-screen keyboard permitting saving files quickly and easily
- Rechargeable and field replaceable lithium-ion battery

Key Measurements

- VSWR
- Return Loss
- DTF (Distance to Fault)
- Cable Loss
- Insertion Loss
- Insertion Gain
- Power Meter
- RF Source

Advanced Functions

- Trace overlay allows comparative analysis of up to 4 traces in a single measurement screen.
- In addition to its 6 markers it also provides up to 3 Marker Bands.
- Reflection measurements are presented in VSWR, Return Loss or Smith Charts.

Introduction

Many of modern wireless base stations are a complex system of multiple RF components such as Low Noise Amplifiers (LNA), duplexers and Tower Mounted amplifiers (TMA). The performance of those RF components directly affects cell site's coverage and capacity. It is essential to have the right instrument to service and verify the proper functionality of those components.

The JD725A has all of necessary measurements functions to perform RF component measurements including, insertion gain, insertion loss, antenna isolation, TMA performance and duplexer antennas verification.

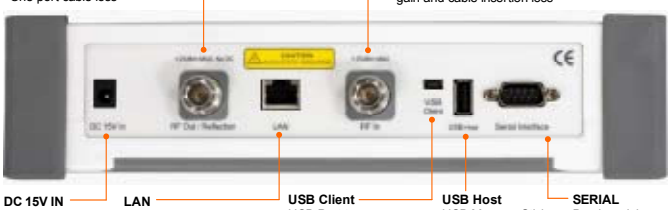
In addition, the JD725A accurately characterizes the site's antenna system including Voltage Standing Wave Ratio (VSWR), Distance To Fault (DTF), cable loss and power measurements.

The JD725A is an easy to use field instrument, equipped with a touch panel color display allowing rapid measurements and obtaining results clearly displayed. Its application software, JDViewer, allows the user to easily compare and analyze measurements and generate professional reports.

The JD725A was designed for field testing operation and is equipped with a rechargeable field replaceable Lithium-Ion battery which enables continuous operation for more than three hours.

Panel Overview

Top View



RF Out/Reflection
50ohm N-type RF Connector to measure VSWR, DTF and One port cable loss

RF In
50ohm N-type RF Connector, in conjunction with RF Out/Reflection port, to measure amplifier gain and cable insertion loss

DC 15V IN
External DC input port

LAN
Ethernet Communication Port To connect a PC with the application SW

USB Client
USB Port to connect a PC with the application SW

USB Host
USB Memory Stick port, used for either saving measurement data or upgrading the instrument's firmware

SERIAL
D-sub serial interface port to connect an optional external power sensor

Front View

VSWR
Measures impedance matching

DTF
Measures distance to fault location

GAIN/ LOSS
Measures amplifier gain and cable insertion loss

POWER METER and SIGNAL GENERATOR
Measures transmission power and generates a CW signal

SYSTEM
Presents system information or upgrades the instrument's firmware

CAL
Performs calibration for VSWR, DTF, Cable Loss and Gain/Loss measurements

POWER & LED
Power ON/OFF
Green LED: Power On status
Red LED: External power

LOAD
Recalls saved traces to compare with current or other saved traces

MARKER
Supports six markers for each trace

AMP
Sets Y-axis Min /Max, limit and limit level

SAVE
Saves screen, trace, and setup

FREQ / DIST
Sets frequency range or selects a standard or custom frequency band. Sets distance and selects standard or custom cables

TRACE
Captures up to 4 traces
Assign saved trace to Trace #

LIGHT
Sets LCD Brightness

PEAK
Identifies the highest peak of the trace

TRACE POINT
Selects trace points among 126, 251, 501 or 1001

SCALE
Changes Y-axis scale, VSWR or Return Loss or Smith Chart

AUTO SCALE
Adjusts Y scale on screen for optimal display of traces

ENTER
Finishes an "entry", which is value or test parameter

HOLD
Pauses current measurement display

KNOB & UP/DOWN
Moves marker positions of items on the table list

SPEAKER
Generates audio, if enabled, for alarms and key selections

ESC
Cancels latest selection or moves to previous menu

SOFT KEY
Selects menu displayed on the screen

SCREEN MENU
Displays selectable menu in connection with function keys or soft keys

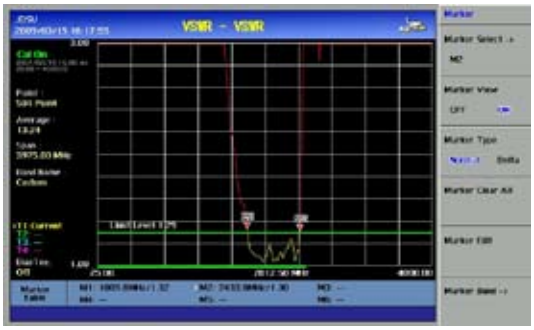
7 " COLOR LCD
Daylight viewable high resolution LCD display

Main Functions

VSWR / Return Loss

VSWR and Return Loss measurements provide the impedance performance and signal reflection characteristics of cable, connectors, and antenna systems.

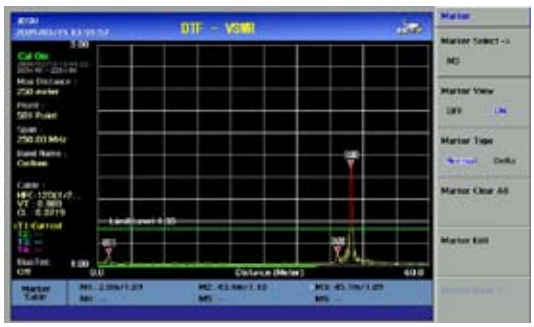
- Frequency range: 25 to 4000MHz
- Dynamic Range: 60dB
- Over 80 wireless frequency bands built-in in the instrument's database
- Flexibility to incorporate additional frequency bands
- User definable limit line for

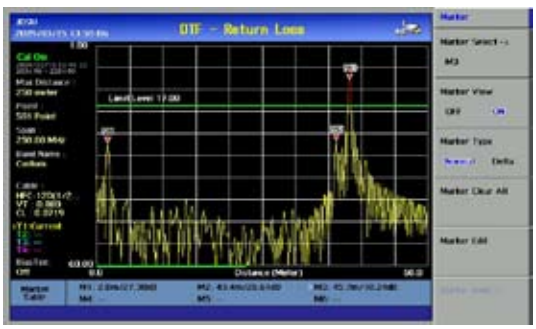


DTF (Distance to Fault)

The DTF measurement function allows user to accurately identify faulty locations.

- Frequency range: 25 to 4000MHz
- Distance: Up to 1250m (4125ft)
- Dynamic Range: 60 dB
- High resolution mode with 1001 points
- Over 95 cable types built-in in the instrument's database
- Flexibility to incorporate additional cable types
- User definable limit line for fast Pass/Fail characterization

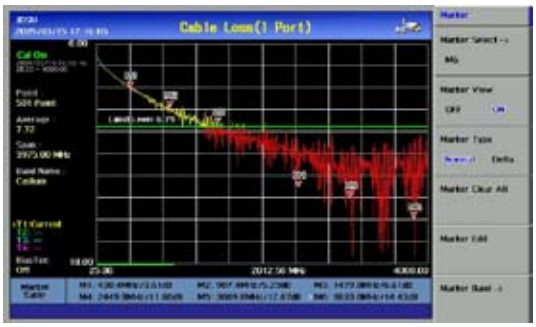


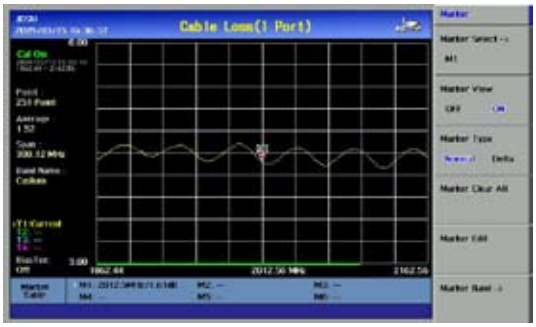


Cable Loss

Cable Loss measures the amount of signal lost by the cable line, this measurement facilitates a rapid compliance verification analysis throughout the transmission line.

- Frequency range: 25 to 4000MHz
- Dynamic Range: 0 to 30dB
- User definable limit line for fast Pass/Fail characterization



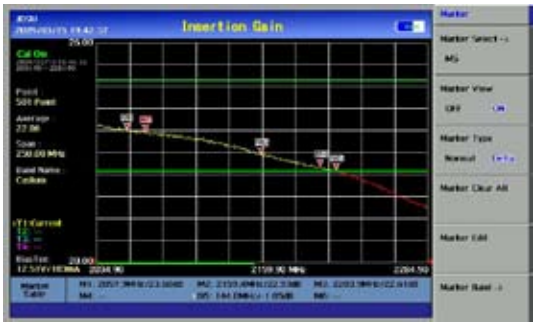


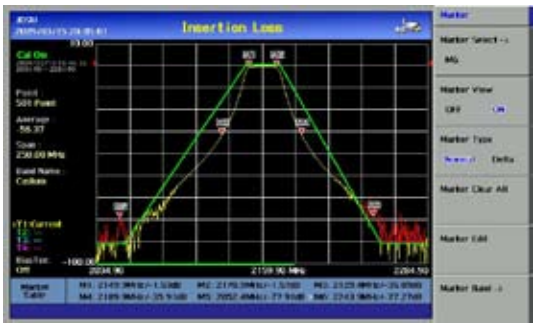
Insertion Gain / Loss

The Insertion Gain measurement simplifies the task of verifying amplifiers and antenna isolation.

Insertion Loss measurements accurately quantifies the amount of signal loss as it passes through a cable, attenuator, filter, amplifier or any other RF device.

- Frequency range: 25 to 4000MHz
- Dynamic Range: -90 to 50dB
- User definable limit line for fast Pass/Fail characterization





Power Meter

The Power Meter function makes power measurements easy and comprehensible using external power sensors. Its configurable settings allow display range, maximum and minimum limits, and the selection of power units in dBm or Watts.

- Lower/Upper power limit can be set for a fast testing through Pass/Fail indication
- Power Sensor types
  - Directional Power Sensor
  - Terminating Power Sensor

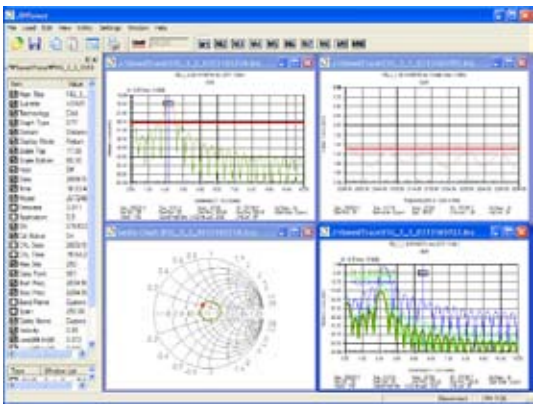
Bias Tee (Option JD725A001)

The optional built-in Bias Tee supplies selectable voltage of 12V to 24V with 3V steps on the RF In port eliminating the need of an external power supply.

Application Software

The JD725A Application Software, JDViewer, provides all the necessary tools to operate the instrument more conveniently including:

- Communication with the instrument via LAN/USB
- Smith Chart support
- VSWR-DTF conversion
- Captures saved plots
- Registers or edits user definable wireless frequency bands into the instrument's custom bands list
- Registers or edits user definable cable types into the instrument's custom cable list
- Edits measurement charts
- Report templates available
- Generates and prints reports
- Exports measurement reports



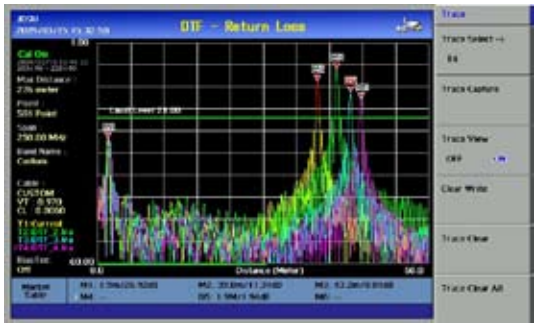
Advanced Functions

The JD725A provides additional functions allowing superior analysis.

Trace Overlay

Trace Overlay allows comparative analysis of up to 4 traces by superimposing them together on one measurement graph.

Additionally, up to 6 markers can be set on any trace among multiple traces to see its corresponding value.



Marker Bands

Marker Bands are user definable markers on frequency sub-bands enabling a visual identification of uplink and downlink frequencies performing compliance verification with a single measurement trace.

Smith Chart

The JD725A is capable of performing Smith Chart measurements to display on the site impedance of the antenna and transmission line.

Specifications

General

Max input power	+25 dBm, ± 50 VDC
Frequency range	25 MHz ~ 4000 MHz
Frequency accuracy	<± 75 ppm
Frequency resolution	100 kHz
Test port impedance	50 Ω
Test ports	Type N Females
Trace storage	Up to 400
Screen storage	Up to 100
Setup storage	Up to 20
Data points	126, 251, 501, 1001
Measurement speed	1, 1.3, 2.5, 5 s for each data point[1)]
One port power	6 dBm (typical)
Two port power	6 dBm (typical) -30 dBm (typical)
Corrected directivity	40 dB typical
One port accuracy	≤ ±(0.8 +|20 log (1+10$^{-EP/20}$)|) dB (typical) EP = Directivity-measured return loss
Immunity to interference	On frequency: +5 dBm On channel: +17 dBm

VSWR

Range	1 dB ~ 65 dB
Resolution	0.01

Return loss

Range	0 dB ~ 60 dB
Resolution	0.01

DTF

Vertical range	VSWR:1 ~ 65 Return Loss 0 dB ~ 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	($1.5x10^8$)(Vp)/(Delta)* 0.95 Vp: cable's relative propagation velocity Delta[Hz] = Stop Freq – Start Freq

Cable Loss (one port)

Range	0 dB ~ 30 dB
Resolution	0.01 dB

Insertion Gain/Loss

Range	25 MHz ~ 2500 MHz: -90 ~ 50 dB 2500 MHz ~ 4000 MHz: -80 ~ 50 dB
Resolution	0.01 dB

RF Source

Power output (nominal)	Selectable -30 dBm or +6 dBm
Resolution	100 kHz

Bias Tee (optional)

Voltage	+12 V ~ +24 V (3 V step)
Current	500 mA steady state (850 mA in rush)

Power Meter (requires optional directional/terminating power sensor)

Display range	-80 dBm ~ +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 MHz ~ 3800 MHz
Power range	Average: 0.15 ~ 150 W (21.76 ~ 51.76 dBm) Peak: 4 ~ 400 W (36.02 ~ 56.02 dBm)
Measurement uncertainty	± 4% of reading + 0.05 W[2,3]
Input return loss	≤ 2500 MHz, 27 dB min > 2500MHz, 25dB
Directivity	27 dB min
Insertion loss	< 1 GHz, < 0.05 dB 1 ~ 2 GHz, < 0.1 dB, 2 ~ 3.8 GHz < 0.13 dB
Connector type	N-female on both ends

JD733A

Sensor type	Average and peak
Frequency range	150 MHz ~ 3500 MHz
Power range	Average: 0.25 ~ 20 W (24 ~ 43 dBm) Peak: 0.25 ~ 20 W (24 ~ 43 dBm)
Measurement uncertainty	± 4% of reading + 0.05 W[2,3]
Input return loss	≤ 2500 MHz, 27 dB Min > 2500 MHz, 25 dB Min
Directivity	27 dB Min
Insertion loss	<1 GHz, <0.05 dB 1 ~2 GHz, < 0.1 dB, 2 ~ 3.5 GHz < 0.13 dB
Connector type	N-female on both ends

Terminating Power Sensors (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[2,3)]
Connector type	N-male

JD72450551

Sensor type	Average
Frequency range	40 MHz ~ 3000 MHz
Power range	~30 dBm ~ 0 dBm (1 µW ~ 1 mW)
Measurement uncertainty	± 10% of reading[2,3)]
Connector type	N-male

JD72450552

Sensor type	Peak
Frequency range	40 MHz ~ 4000 MHz
Power range	~40 dBm ~ 0 dBm (0.1 µW ~ 1 mW)
Measurement uncertainty	± 10% of reading[2,3]
Connector type	N-male

Miscellaneous

Dimension	260 x 190 x 60 mm (10.2" x 7.5" x 2.4")
Weight	< 2.1 kg (4.62 lbs)
Battery	Li-ion (>3hrs continuous operating)
Operating temperature	-10 ~ 50 °C (14 ~ 122 °F)
Storage temperature	-40 ~ 80 °C (-40 ~ 176 °F)
Humidity	95% no condensation

1) Measurement speed provided at one-port measurements.
2)The specification provided at a temperature of 25°C ± 10°C.
3) CW condition
*All Specifications based on calibrating at 25°C after 5 minute warm-up.

Ordering Information

Mainframe

JD725A	Cable and Antenna Analyzer - Dual Port, 25 MHz ~ 4000 MHz

Optional

JD725A001	Bias Tee

Standard Accessories

Soft carring case
AC-DC adapter
Cross LAN cable (1.5 m)
1 GB USB memory
Automotive Cigarette Lighter/12V DC Adapter
Lithium-Ion battery
Stylus pen
User's manual and application software on CD
2 years warranty

Optional Accessories

JD72550507	Dual Port Calibration Kit (N), 40 dB 4 GHz • Open-Short-Load, 40 dB, 4 GHz • Load, 40 dB, 4 GHz • Two adapters N(f) to N(f), DC to 4 GHz, 50 Ω • Two RF test cables (1 m), N(m) to N(m)
GC72450531	RF cable, 1.5 m N(m)-N(f)
GC72450532	RF cable, 3.0 m N(m)-N(f)
JD72350542	Hard case
JD72550562	JD725A User's Manual - printed version
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
G710050581	Attenuator 40 dB, 100 W DC to 4 GHz (unidirectional)
GC7256000	JD725A Warranty extension of 1 year for Asia, North America
GC7256001	JD725A Warranty extension of 1 year for Latin America, EMEA

Power Meter Accessories

JD731A	Directional power sensor, 300 ~ 3800 MHz, Average 0.15 ~ 150 W, Peak 4 ~ 400W
JD733A	Directional power sensor, 150 ~ 3500 MHz, Average/Peak 0.25 ~ 20 W
JD732A	Terminating average power sensor 20 MHz~ 3800 MHz, -30 ~ +20 dBm
JD734A	Terminating peak power sensor, 20 ~ 3800 MHz, -30 ~ +20 dBm
JD736A	Terminating average and peak power sensor, 20 ~ 3800 MHz, -30 ~ +20 dBm
JD72450551	Terminating average power sensor, 40 ~ 3000 MHz, -30 ~ 0 dBm
JD72450552	Terminating peak power sensor, 40 ~ 4000 MHz, -40 ~ 0 dBm
G710050581	Attenuator 40 dB, 100 W, DC to 4 GHz (unidirectional)

Test & Measurement Regional Sales

NORTH AMERICA
TEL: 1 866 228 3762
FAX: +1 301 353 9216

LATIN AMERICA
TEL: +1 954 688-5660
FAX: +1 954 3454668

ASIA PACIFIC
TEL:+852 2892 0990
FAX:+852 2892 0770

EMEA
TEL:+49 7121 86 2222
FAX:+49 7121 86 1222

www.jdsu.com/test