

# JD723A/JD724B/JD726A

## Cable and Antenna Analyzers



### 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
- Power Meter

### 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

The majority of problems in mobile networks occur at the base station infrastructure composed of the antenna system, cables, and connectors. It's essential to have the optimal instrument for properly servicing or installing cell sites.

JDSU's JD723A, JD724B, and JD726A Cable and Antenna Analyzers are the optimal test solution to characterize cell site's infrastructure due to its handheld design, ease of use, and rich functionality.

The JD723A, JD724B, and JD726A have all of the measurement functions necessary to accurately verify the site's transmission line and antenna system from signal reflections (VSWR or Return Loss) to RF transmission power.

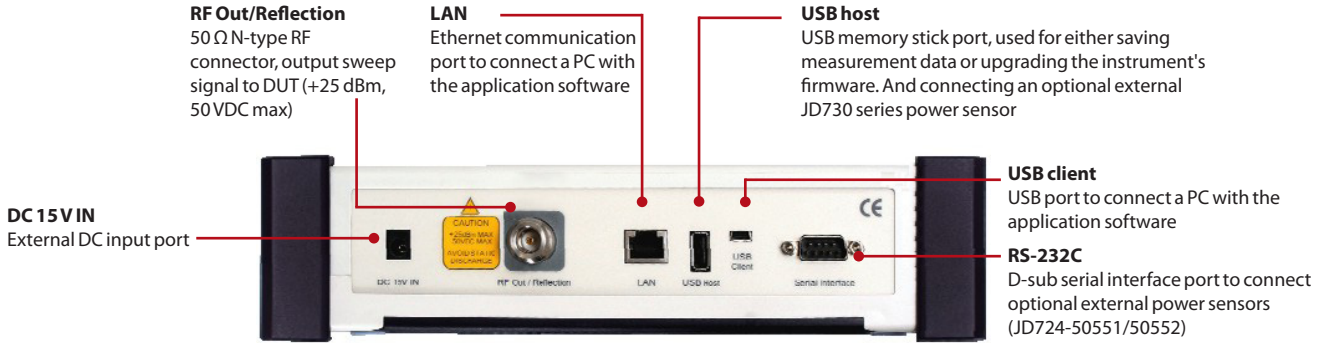
In addition, the JD723A, JD724B, and JD726A make accurate Distance-To-Fault (DTF) measurements properly identifying fault's location.

The instrument's touch panel operation and 7 inch wide TFT color display allows measurements to be easily made and displayed. Its application specific software allows the user to easily compare and analyze measurements and generate professional reports.

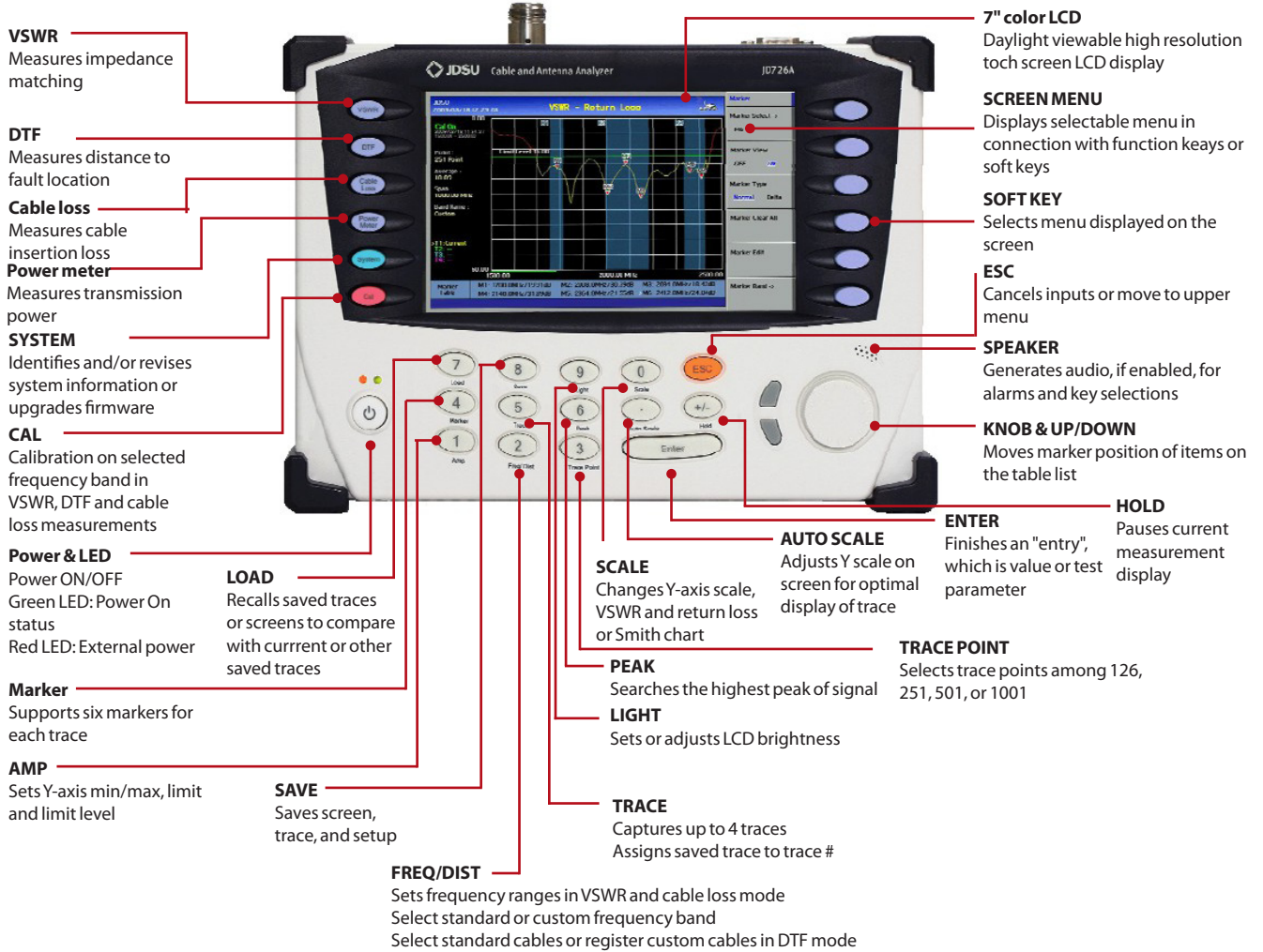
A rechargeable and field installable lithium-ion battery for operating longer than three hours is part of the JD723A, JD724B and JD726A.

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Top View



Front view



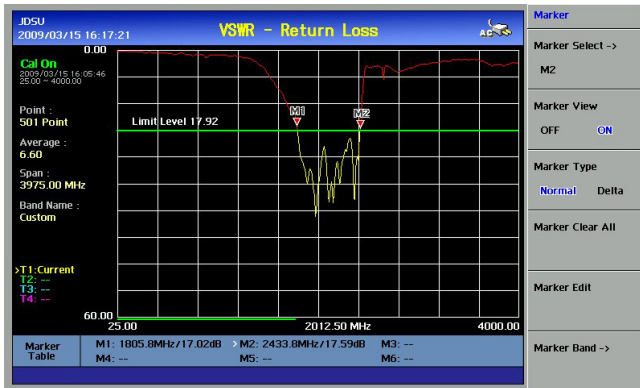
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## Main Functions

### VSWR / Return Loss

VSWR and Return Loss measurements provide the impedance matching performance and signal reflection characteristics of the cell site. The JD723A, JD724B, and JD726A provide high resolution VSWR/Return Loss measurement capability.

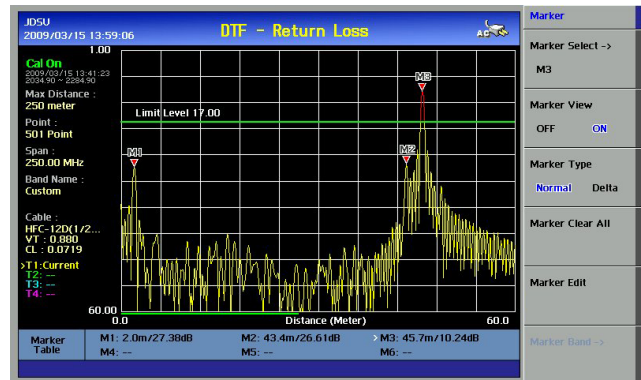
- Frequency Range:
  - JD723A: 100 to 2700 MHz
  - JD724B: 25 to 4000 MHz
  - JD726A: 5 to 6000 MHz
- Dynamic Range: 60 dB.
- Over 80 wireless frequency bands built-in in the instrument's database.
- Flexibility to incorporate additional frequency bands.
- User-definable limit lines for fast Pass/Fail characterization.



### DTF (Distance to Fault)

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

- Frequency Range:
  - JD723A: 100 to 2700 MHz
  - JD724B: 25 to 4000 MHz
  - JD726A: 5 to 6000 MHz
- Distance: Up to 1,250 m (4,125 ft).
- Dynamic Range: 60 dB.
- Resolution: 1001 data points.
- Cable types: Over 95 cable types builtin in the instrument's database. And capable of incorporating additional cable types.
- Ease of use: User-definable limit lines for fast Pass/Fail characterization.



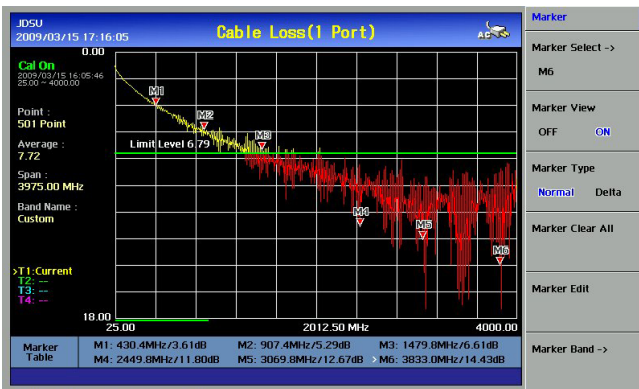
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Main Functions (cont'd)

Cable Loss

Cable Loss measures the signal loss through a cable or other devices over a defined frequency range. It is sufficient to connect one end of the cable to the instrument measurement port. The other end of the cable is terminated with a short or left it open.

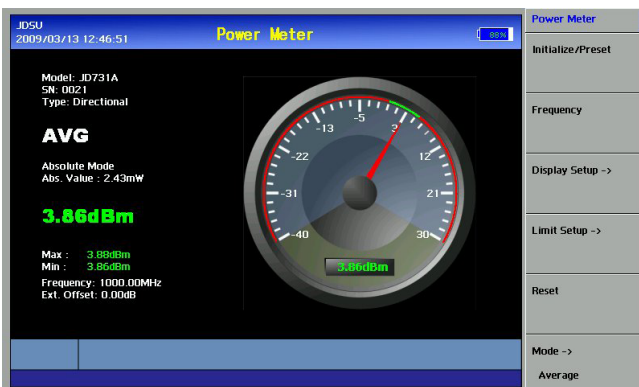
- Frequency range:
  - JD723A: 100 to 2700 MHz
  - JD724B: 25 to 4000 MHz
  - JD726A: 5 to 6000 MHz
- Dynamic Range: 0 to 30 dB.
- User-definable limit line for fast Pass/Fail characterization.



Power Meter

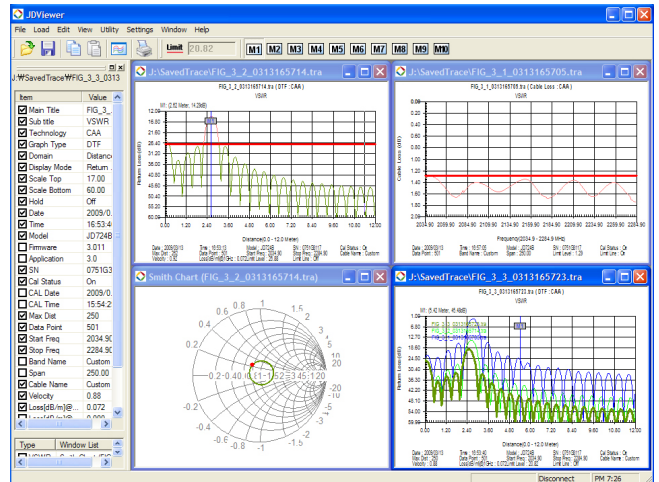
The Power Meter function makes power measurements easy and comprehensible using external power sensors. Its configurable settings allow display range, maximum and minimum limits, and the selection of power units in dBm or Watts.

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



Application Software

- The JD723A, JD724B and JD726A Application Software, JDViewer, provides all the necessary tools to operate the instrument more conveniently including:
  - Communication with the instrument via LAN/USB.
  - Smith Chart conversion.
  - 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.
  - Generates and prints reports.
  - Exports measurement data.



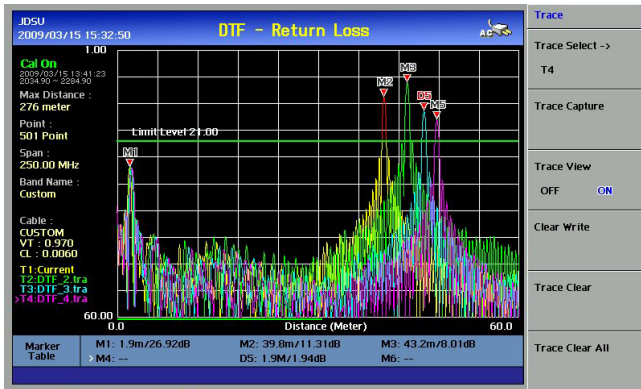
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Advanced Functions

The JD723A, JD724B, and JD726A provide additional functionality allowing superior analysis.

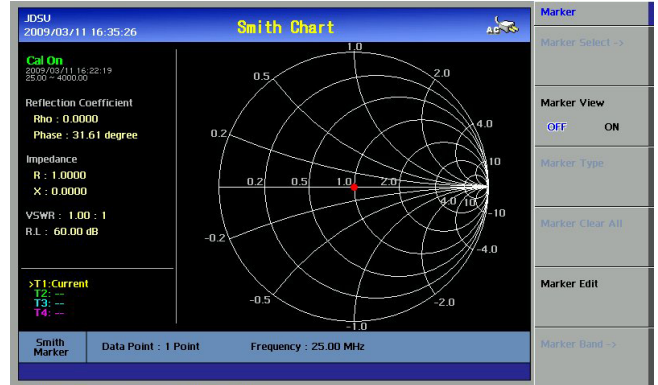
Trace Overlay

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.



Smith Chart

The JD723A, JD724B, and JD726A are capable of performing Smith Chart measurements to display on the site impedance of the antenna and transmission line.



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.



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Specifications

**The Cable and Antenna Analyzer specifications apply under the following conditions.**

- After 10 minutes warm-up and then one hour of operation temperature.
- The instrument is operating within a valid calibration period.
- Data with no tolerance is considered as typical values.
- The ‘typical’ or ‘nominal’ values are defined as follows:
  - Typical: Expected performance of the instrument operating under 20 °C to 30 °C after being at this temperature for one hour.
  - Nominal: A general, descriptive term or parameter.

**Frequency**

	Supplemental Information
Range	100 to 2700 MHz (JD723A) 25 to 4000 MHz (JD724B) 5 to 6000 MHz (JD726A)
Resolution	100 kHz
Accuracy	< ±75 ppm

**Data Points**

126, 251, 501, 1001
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**Measurement Speed**

2.6 ms/point (JD723A and JD724B) <sup>1</sup>
1.6 ms/point (JD726A)

**Measurement Accuracy**

Corrected Directivity	40 dB	Typical
Reflection	$\pm(0.3 +  20\log(1 + 10-EP/20) )$	Typical
Uncertainty	EP = Directivity – Measured Return Loss	

**Output Power**

0 dBm	Nominal
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**Dynamic Range**

Reflection	60 dB
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**Interference Immunity**

On Channel	+10 dBm	Nominal
On Frequency	+3 dBm	Nominal

**Measurements**

**Reflection (VSWR)**

VSWR range	1 to 65
Return Loss range	0 to 60 dB

Resolution	0.01
1 As of serial number ≥ 1047G4901	

**Distance to Fault (DTF)**

Vertical VSWR range	1 to 65	
Vertical return loss range	0 to 60 dB	
Vertical resolution	0.01	
Horizontal range	0 to (# of data point – 1) × Maximum = 1250 m	
Horizontal resolution	horizontal resolution (4125 ft)	
Horizontal resolution	$(1.5 \times 10^8) \times (Vp)/(\Delta) \times (0.95)$	Vp = Propagation Velocity Delta = Stop – Start Freq [Hz]

**Cable Loss (1 Port)**

Range	0 to 30 dB
Resolution	0.01 dB

**RF Power Meter (Requires optional power sensor)**

Display range	–80 to +120 dBm	
Offset range	0 to 60 dB	
Resolution	0.01 dB or 0.1 xW	x = m, μ, p

**Directional power sensor (JD731A and JD733A)**

Measurement type	Forward/reverse average power forward peak power
Frequency range	300 to 3800 MHz (JD731A) 150 to 3500 MHz (JD733A)
Power range	Average 0.15 to 150 W (JD731A) Peak 4 to 400 W (JD731A) Average/Peak 0.1 to 50 W (JD733A)
Measurement uncertainty	±4 % of reading + 0.05 W <sup>2,3</sup>
Input return loss	≤ 2500 MHz, 27 dB min > 2500 MHz, 25 dB
Directivity	27 dB min
Insertion loss	≤ 1 GHz, < 0.05 dB < 1 to 2 GHz, < 0.10 dB < 2 to 3.8 GHz, < 0.13 dB
Connector type	Type-N female on both ends

**Terminating power sensor (JD732A, JD734A, and JD736A)**

Measurement type:	Average (JD732A) Peak (JD734A) Average and Peak (JD736A)
Frequency range	20 to 3800 MHz
Power range	–30 to +20 dBm
Measurement uncertainty	±7 % of reading <sup>2,3</sup>
Connectivity	USB
Connector type	Type-N male

<sup>2</sup>The specification provided at a temperature 25 °C ± 10 °C

<sup>3</sup>CW Condition

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Specifications (cont'd)

**Terminating Power Sensor (JD72450551)**

Measurement type	Average
Frequency range	40 to 3000 MHz
Power range	-30 to 0 dBm
Measurement uncertainty	±10 % of reading <sup>4,5</sup>
Connectivity	Serial
Connector type	Type-N male

**Terminating Power Sensor (JD72450552)**

Measurement type	Peak
Frequency range	40 to 4000 MHz
Power range	-40 to 0 dBm
Measurement uncertainty	±10 % of reading <sup>4,5</sup>
Connectivity	Serial
Connector type	Type-N male

**General Information**

**Reflection/RF Out**

Connector	Type-N female
Impedance:	50 Ω Nominal
Damage level	> +25 dBm, > ±50 VDC

**Connectivity**

USB	Type A	For flash drive or power sensor
	Mini B	For JDViewer connection
LAN	RJ45, 10/100 Base-T	For JDViewer connection
Serial	9-pin D-SUB male	For JD72450551/50552

**Display**

Type	Resistive touch screen
Size	7 inch transfective
Resolution	800 × 480

**Speaker**

Build-in speaker
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**Power**

External DC input	12 to 15 VDC
Power	15 W
Consumption	28.5 W maximum when battery charging for JD723A/JD724B
	58.2 W maximum when battery charging for JD726A

**External AC Power Adapter**

Input	100 to 250 V 50 to 60 Hz, 1.2 A	Nominal
Output	15 VDC, 3.33 A	

**Battery**

	10.8 V, 4800 mA-h	Lithium Ion
Operation time	> 3 hours	Typical
Storage temperature	-10 to 60 °C, 20 to 85 % RH -14 to 140 °F, 20 to 85 % RH	The battery pack should be stored in an environment with low humidity. Extended exposure to temperature above 45 °C could degrade battery performance and life.

**Data Storage**

Internal	Up to 400 for trace Up to 100 for screen Up to 20 for setup
External	Limited by size of USB flash drive

**Environmental**

Operation temperature	-10 to 50 °C (14 to 122 °F)
Humidity	95 % With no condensation
Storage temperature	-40 to 80 °C (-40 to 176 °F)

**EMC**

EN 61326-2-1	Complies with European EMC
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**Size and Weight**

Weight	< 2.0 kg (4.41 lbs) (JD723A/JD724B) With battery
	< 2.1 kg (4.63 lbs) (JD726A) With battery
Size	260 × 190 × 60 (mm) Approximately (W × H × D)
	10.2 × 7.5 × 2.4 (inch)

**Warranty**

2 years
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**Calibration cycle**

2 years
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<sup>4</sup>The specification provided at a temperature 25 °C±10 °C

<sup>5</sup>CW Condition

**Ordering information**
**Basic Model**

JD723A	Cable and Antenna Analyzer (100 to 2700 MHz) <sup>1</sup>
JD724B	Cable and Antenna Analyzer ( 25 to 4000 MHz) <sup>1</sup>
JD726A	Cable and Antenna Analyzer ( 5 to 6000 MHz) <sup>1</sup>

**Standard Accessories**

JD72350541	Soft Carrying Case <sup>2</sup>
GC72450522	AC-DC Adapter <sup>2</sup>
G710550335	Cross LAN Cable (1.5m) <sup>2</sup>
GC72450517	1GByte USB Memory <sup>2</sup>
GC72450523	Automotive Cigarette Lighter/12V DC Adapter <sup>2</sup>
GC72450521	Lithium-Ion Battery <sup>2</sup>
G710550316	Stylus Pen <sup>2</sup>
JD72350561	User's Manual and Application Software CD

<sup>1</sup>Requires Calibration Kit

<sup>2</sup>Standard accessories can be purchase separately.

**Optional Calibration Kits**

JD72450509	Y - Calibration Kit, Type-N(m), DC to 4 GHz, 50 Ω
JD72450510	Y - Calibration Kit, DIN(m), DC to 4 GHz, 50 Ω
JD72650509	Y - Cabilbration kit, Type-N(m), DC to 6 GHz, 50 Ω

Note: select one calibration kit and one RF cable

**Optional RF Cables**

G710050531	1.5 m (4.92 ft) RF Cable, DC to 18 GHz, Type-N(m) to Type-N(f), 50 Ω
G710050532	3.0 m (9.84 ft) RF Cable, DC to 18 GHz, Type-N(m) to Type-N(f), 50 Ω

**Optional Power Sensors**

JD731A	Directional Power Sensor, 300 to 3800 MHz, Average 0.15 to 150 W, Peak 4 to 400 W
JD733A	Directional Power Sensor, 150 to 3500 MHz, Average/Peak 0.25 to 50 W
JD732A	Terminating Average Power Sensor, 20 to 3800 MHz, -30 to +20 dBm
JD734A	Terminating Peak Power Sensor, 20 to 3800 MHz, -30 to +20 dBm
JD736A	Terminating Average and Peak Power Sensor, 20 to 3800 MHz, -30 to +20 dBm
JD72450551	Terminating Average Power Sensor, 40 to 3000 MHz, -30 to 0 dBm
JD72450552	Terminating Peak Power Sensor, 40 to 4000 MHz, -40 to 0 dBm

**Optional Adapters**

G710050571	Adapter Type-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 Type-N(m) to SMA(f), DC to 18 GHz, 50 Ω
G710050574	Adapter Type-N(m) to BNC(f), DC to 1.5 GHz, 50 Ω
G710050575	Adapter Type-N(f) to Type-N(f), DC to 4 GHz, 50 Ω
G710050576	Adapter Type-N(m) to DIN(m), DC to 4 GHz, 50 Ω
G710050577	Adapter Type-N(f) to DIN(f), DC to 4 GHz, 50 Ω
G710050578	Adapter Type-N(f) to DIN(m), DC to 4 GHz, 50 Ω
G710050579	Adapter DIN(f) to DIN(f), DC to 4 GHz, 50 Ω

**Optional Miscellaneous**

G710050581	Attenuator 40 dB, 100 W, DC to 4 GHz (Unidirectional)
JD72350542	JD720 Hard Carrying Case
JD72650562	JD723A/JD724B/JD726A User's Manual – Printed Version