

# JD745A

## CellAdvisor™ Base Station Analyzer



**Spectrum Analyzer: 100 kHz to 4 GHz**

**Cable and Antenna Analyzer: 5 MHz to 4 GHz**

**Power Meter: 10 MHz to 4 GHz**

### Specification Conditions

The JD745A specifications apply under these conditions:

- The instrument has been turned on for at least 15 minutes
- The instrument is operating within a valid calibration period
- Data with no tolerance are considered typical values
- Cable and antenna measurements apply after calibration to the OSL standard
- Typical and nominal values are defined as:
  - Typical: expected performance of the instrument operating under 20° to 30°C after being at this temperature for 15 minutes
  - Nominal: a general, descriptive term or parameter

### Spectrum Analyzer (Standard)

Frequency	
Frequency range	100 kHz to 4 GHz
Internal 10 MHz Frequency Reference	
Accuracy	±0.05 ppm + aging (0 to 50°C)
Aging	±0.5 ppm/year
Frequency Span	
Range	0 Hz (zero span) 10 Hz to 4 GHz
Resolution	1 Hz
Resolution Bandwidth (RBW)	
–3 dB bandwidth	1 Hz to 3 MHz      1-3-10 sequence
Accuracy	±10% (nominal)
Video Bandwidth (VBW)	
–3 dB bandwidth	1 Hz to 3 MHz      1-3-10 sequence
Accuracy	±10% (nominal)

Single Sideband (SSB) Phase Noise	
Fc 1 GHz, RBW 10 kHz, VBW 1 kHz, RMS detector	
Carrier offset:	
30 kHz	<–90 dBc/Hz (typical)
100 kHz	<–95 dBc/Hz (typical)
1 MHz	<–102 dBc/Hz (typical)
Measurement Range	
DANL to +20 dBm	
Input attenuator range	0 to 50 dB, 5 dB steps
Maximum Input Level	
Average continuous power	+20 dBm
DC voltage	±50 VDC
Displayed Average Noise Level (DANL)	
1 Hz RBW, 1 Hz VBW, 50 Ω termination, 0 dB attenuation, RMS detector	
Preamplifier Off:	
10 MHz to 2.3 GHz	–140 dBm (–146 dBm, typical)
>2.3 GHz to 3 GHz	–138 dBm (–144 dBm, typical)
>3 GHz to 4 GHz	–135 dBm (–140 dBm, typical)
Preamplifier On:	
10 MHz to 2.3 GHz	–155 dBm (–160 dBm, typical)
>2.3 GHz to 3 GHz	–153 dBm (–158 dBm, typical)
>3 GHz to 4 GHz	–150 dBm (–156 dBm, typical)

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**Display Range**

Log scale and units (10 divisions displayed)	1 to 20 dB/division in 1 dB steps dBm, dBV, dBmV, dBμV
Linear scale and units (10 divisions displayed)	V, mV, mW, W
Detectors	Normal, positive peak, sample, negative peak, RMS
Number of traces	6
Trace functions	Clear/write, maximum hold, minimum hold, capture, load view on/off

**Total Absolute Amplitude Accuracy**

Preamplifier off, power level > -50 dBm, auto-coupled (20 to 30°C)		
5 MHz to 4 GHz	±1.25 dB, ±0.5 dB (typical)	Attenuation <40 dB
	±1.55 dB, ±1.0 dB (typical)	Attenuation ≥40 dB

**Reference Level**

Setting range	-120 to +100 dBm
Setting resolution	
Log scale	0.1 dB
Linear scale	1% of reference level

**Markers**

Marker types	Normal, delta, delta pair, noise, frequency count marker
Number of markers	6
Marker functions	Peak, next peak, peak left, peak right, minimum search marker to center/start/stop

**RF Input VSWR**

20 MHz to 4 GHz	1.5:1 (typical)
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**Second Harmonic Distortion**

Mixer level = -25 dBm	
10 MHz to 1.3 GHz	<-65 dBc (typical)
>1.3 GHz to 4 GHz	<-70 dBc (typical)

**Third-order Inter-modulation (Third-order Intercept: TOI)**

200 MHz to 2 GHz	+10 dBm (typical)
>2 GHz to 4 GHz	+12 dBm (typical)

**Spurious**

Inherent residual response	
Input terminated, 0 dB attenuation, preamplifier off, RBW at 10 kHz	
20 MHz to 3 GHz	-90 dBm (nominal)
>3 GHz to 4 GHz	-85 dBm (nominal)
Exceptions	<-80 dBm @ 311.94 MHz <-84 dBm @ 415.92 MHz <-85 dBm @ 519.90, 1599.00, and 2497.80 MHz
Input related spurious	<-70 dBc (nominal)

**Dynamic Range**

2/3 (TOI-DANL) in 1 Hz RBW	>95 dB
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**Sweep Time**

Range	80 ms to 1000 s	
	24 μs to 200 s	Span = 0 Hz (zero span)
Sweep mode	Continuous, single	

**Gated Sweep**

Trigger source	External, video, and GPS
Gate length	1 μs to 100 ms
Gate delay	0 to 100 ms

**Trigger**

Trigger source	Free run, video, external
Trigger delay	
Range	0 to 200 s
Resolution	6 μs

**Measurements\***

Channel power
Occupied bandwidth
Spectrum emission mask
Adjacent channel power
Spurious emissions
Field strength
AM/FM audio demodulation
Route map
PIM detect
Dual spectrum

\* CW signal generator (Option 003) can be set up simultaneously.

**Cable and Antenna Analyzer (Standard)****Frequency**

Range	5 MHz to 4 GHz
Resolution	10 kHz
Accuracy	±25 ppm

**Data Points**

	126, 251, 501, 1001
Measurement speed	1.65 ms/point (nominal)

**Measurement Accuracy**

Corrected directivity	40 dB (typical)
Reflection uncertainty	$\pm(0.3 +  20\log(1+10^{-EP/20}) )$ (typical) EP = directivity - measured return loss

**Output Power**

High	0 dBm (typical)
Low	-30 dBm (typical)

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Dynamic Range	
Reflection	60 dB

  

Maximum Input Level	
Average continuous power	+25 dBm (nominal)
DC voltage	±50 VDC

  

Interference Immunity	
On channel	+17 dBm @>1.4 MHz from carrier frequency (nominal)
On frequency	0 dBm within ±10 kHz from the carrier frequency (nominal)

Measurements	
<b>Reflection (VSWR)</b>	
VSWR range	1 to 65
Return loss range	0 to 60 dB
Resolution	0.01
<b>Distance to Fault (DTF)</b>	
Vertical VSWR range	1 to 65
Vertical return loss range	1 to 60 dB
Vertical resolution	0.01
Horizontal range	0 to (# of data points – 1) x Horizontal Resolution Maximum = 1500 m (4921 ft)
Horizontal resolution	$(1.5 \times 10^8) \times (V_p) / (\text{delta}) \times (0.95)$ $V_p$ = propagation velocity Delta = stop freq. – start freq. (Hz)
<b>Cable Loss (1-port)</b>	
Range	0 to 30 dB
Resolution	0.01 dB
<b>1-port Phase</b>	
Range	–180° to +180°
Resolution	0.01°
<b>Smith Chart</b>	
Resolution	0.01

## RF Power Meter (Standard)

General Parameters	
Display range	–100 to +100 dBm
Offset range	0 to 60 dB
Resolution	0.01 dB or 0.1xW (x = m, u, p)

  

Internal RF Power Sensor	
Frequency range	10 MHz to 4 GHz
Span	100 kHz to 100 MHz
Dynamic range	–120 to +20 dBm
Maximum power	+20 dBm
Accuracy	Same as spectrum analyzer

External RF Power Sensors	
<b>Directional Power Sensor JD731B</b>	
Frequency range	300 MHz to 3.8 GHz
Dynamic range	0.15 to 150 W (average) 4 to 400 W (peak)
Connector type	Type-N female on both ends
Measurement type	Forward/reverse average power, forward peak power, VSWR
Accuracy	±(4% of reading + 0.05 W) <sup>1,2</sup>
<b>Directional Power Sensor JD733A</b>	
Frequency range	150 MHz to 3.5 GHz
Dynamic range	0.1 to 50 W (average) 0.1 to 50 W (peak)
Connector type	Type-N female on both ends
Measurement type	Forward/reverse average power, forward peak power, VSWR
Accuracy	±(4% of reading + 0.05 W) <sup>1,2</sup>
<b>Terminating Power Sensor JD732B</b>	
Frequency range	20 MHz to 3.8 GHz
Dynamic range	–30 to +20 dBm
Connector type	Type-N male
Measurement type	Average
Accuracy	±7% <sup>1</sup>
<b>Terminating Power Sensor JD734B</b>	
Frequency range	20 MHz to 3.8 GHz
Dynamic range	–30 to +20 dBm
Connector type	Type-N male
Measurement type	Peak
Accuracy	±7% <sup>1</sup>
<b>Terminating Power Sensor JD736B</b>	
Frequency range	20 MHz to 3.8 GHz
Dynamic range	–30 to +20 dBm
Connector type	Type-N male
Measurement type	Average and Peak
Accuracy	±7% <sup>1</sup>

1. CW condition at 25°C ±10°C.

2. Forward power.

## Optical Power Meter (Option 13)

Optical Power Meter	
Display range	–100 to +100 dBm
Offset range	0 to 60 dB
Resolution	0.01 dB or 0.1 mW

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**External Optical Power Sensors**

<b>Optical Power Sensor</b>	<b>MP-60</b>
Wavelength range	780 to 1650 nm
Max permitted input level	+10 dBm
Connector input	Universal 2.5 and 1.25 mm
Accuracy	±5%
<b>Optical Power Sensor</b>	<b>MP-80</b>
Wavelength range	780 to 1650 nm
Max permitted input level	+23 dBm
Connector input	Universal 2.5 and 1.25 mm
Accuracy	±5%

**2-Port Transmission Measurements (Option 001)****Frequency**

Frequency range	5 MHz to 4 GHz
Frequency resolution	10 kHz

**Output Power**

High	0 dBm (typical)
Low	-30 dBm (typical)

**Measurement Speed**

Vector	2.2 ms/point (nominal)
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**Dynamic Range**

Vector	5 MHz to 3 GHz, 80 dB >3 GHz to 4 GHz, 75 dB
Scalar	5 MHz to 4 GHz, >100 dB

**Measurements****Insertion Loss/Gain**

Range	-120 to 100 dB
Resolution	0.01 dB

**2-Port Phase**

Range	-180° to +180°
Resolution	0.01°

**Bias-Tee (Option 002)****Voltage**

Voltage range	+12 to +32 V
Voltage resolution	0.1 V

**Power**

8 W Max

**CW Signal Generator (Option 003)****Frequency**

Frequency range	25 MHz to 4 GHz
Frequency reference	±25 ppm Maximum
Frequency resolution	10 kHz

**Output Power**

Range	0 dBm, -30 to -80 dBm
Step	1 dB
Accuracy	±1.5 dB (15 to 35°C)

**GPS Receiver and Antenna (Option 010)****GPS Indicator**

Latitude, longitude, altitude

**High-Frequency Accuracy**

Spectrum, interference, and signal analyzer

GPS lock	±25 ppb
Hold over (for 3 days)	±50 ppb (0 to 50°C) 15 minutes after satellite locked

Connector	SMA, female
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**Interference Analyzer (Option 011)****Measurements**

Spectrum analyzer	Sound indicator, AM/FM audio demodulation, interference ID, spectrum recorder
Spectrogram	Collect up to 72 hours of data
RSSI	Collect up to 72 hours of data
Interference finder	
Spectrum replayer	
Dual spectrogram	

**Channel Scanner (Option 012)****Frequency Range**

10 MHz to 4 GHz

**Measurement Range**

-110 to +20 dBm

**Measurements**

Channel scanner	1 to 20 channels
Frequency scanner	1 to 20 frequencies
Custom scanner	1 to 20 channels or frequencies

## GSM/GPRS/EDGE Signal Analyzer (Option 022)

### General Parameters

Frequency range	450 MHz to 500 MHz 820 MHz to 965 MHz 1.705 GHz to 1.995 GHz	
Input signal range	-40 to +20 dBm	
Burst power	±1.0 dB	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
GMSK modulation quality		
Phase RMS accuracy	±1.0 degrees	(0 < Phase RMS < 8)
Residual error	0.7 degrees (typical)	
Phase peak accuracy	±2.0 degrees	(0 < Phase peak < 30)
8 PSK modulation quality		
EVM accuracy	±1.5%	(2% < EVM < 8%)
Residual error	2.5%	
RF power vs. time	±0.25 symbol	

### Measurements

	Option 022		Option 042
<b>Channel power</b>	<b>Constellation</b>	<b>Auto measure</b>	<b>Channel/frequency scanner</b>
Channel power	Burst power	Channel power	Channels or frequencies
Spectral density	Modulation type	Occupied bandwidth	Absolute power
Peak to average power	Frequency error	Spectrum emission mask	Group (traffic, control)
<b>Occupied bandwidth</b>	Phase error RMS	Spurious emission mask	BSIC (NCC, BCC)
Occupied bandwidth	Phase error peak	Burst power	<b>Multipath profile</b>
Integrated power	I/Q origin offset*	PvsT – Mask	(10 strongest)
Occupied power	TSC	Frame average power	Frame average power
<b>Spectrum emission mask</b>	BSIC	Frequency error	SNR, delay
Reference power	C/I*	Phase error RMS	<b>Modulation analyzer</b>
Peak level at defined range	EVM RMS*	Phase error peak	Frame avg power trend
<b>Spurious emissions</b>	EVM Peak*	EVM RMS*	C/I trend
Peak frequency at defined range	EVM 95 <sup>th</sup> *	EVM Peak*	Frame average power
Peak level at defined range		I/Q origin offset	BSIC, frame no. and time
<b>Power vs. time (Slot)</b>		C/I*	C/I, frequency error
Burst power			Burst power
Max/min point			Modulation type
<b>Power vs. time (Frame)</b>			
Frame average power			
Burst power (Slot 0 to 7)			
TSC (Slot 0 to 7)			

Longitude, latitude, and satellite in all screens

\* Measurements performed for 8PSK modulation signals (EDGE) only.

**WCDMA/HSPA+ Signal Analyzer (Option 023)**

<b>General Parameters</b>		
Frequency range	Band 1 to 14, 19 to 22, 25, 26	
Input signal range	-40 to +20 dBm	
RF channel power accuracy	±1.0 dB, ±0.7 dB (typical)	
Occupied bandwidth accuracy	±100 kHz	
Adjacent channel leakage ratio (ACLR)	<-56 dB, ±0.7 dB at 5 MHz offset <-58 dB, ±0.8 dB at 10 MHz offset	
WCDMA modulation	QPSK	
HSPA+ modulations	QPSK, 16 QAM, 64 QAM	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
EVM accuracy	±2.0%	2% ≤ EVM ≤ 20%
Residual EVM	2.5% (typical)	
Code domain power	±0.5 dB relative power ±1.5 dB absolute power	Code channel power >-25 dB Code channel power >-25 dB
CPICH power accuracy	±0.8 dB (typical)	

**Measurements**

	<b>Option 023</b>		<b>Option 043</b>
<b>Channel power</b>	<b>Constellation</b>	<b>Codogram</b>	<b>Channel scanner (up to 6)</b>
Channel power	CPICH power	Code utilization	Frequencies or channels
Spectral density	Rho, EVM	<b>RCSI</b>	Channel power, scramble code, CPICH power, Ec/Io
Peak to average power	Peak CDE	CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH	<b>Scramble scanner (up to 6)</b>
<b>Occupied bandwidth</b>	Frequency error	<b>CDP table</b>	Channel power
Occupied bandwidth	Time offset	Reference power	CPICH dominance
Integrated power	Carrier feed-through	Code utilization	Scramble code
Occupied power	Scramble code	Code, spreading factor	Ec/Io, CPICH power, delay
<b>Spectrum emission mask</b>	<b>Code domain power</b>	Allocation (channel type)	<b>Multipath profile</b>
Reference power	Abs/Rel code power	EVM, modulation type	Channel, multipath power
Peak level at defined range	Individual code EVM and its constellation	Relative, absolute power	Ec/Io, delay
<b>ACLR</b>	Channel power	<b>Auto measure</b>	<b>Code domain power</b>
Reference power	Power bar graph	Channel power	Abs/Rel code power
Abs power at defined range	(Abs/Rel/Delta power)	Occupied bandwidth	Individual code EVM
Rel power at defined range	CPICH, P-CCPCH, S-CCPCH	Spectrum emission mask	Channel power
<b>Multi-ACLR</b>	PICH, P-SCH, S-SCH	ACLR	Scramble code
Lowest reference power	Max, avg active power	Multi-ACLR	CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH
Highest reference power	Max, avg inactive power	Spurious emission mask	Max, avg active power
Abs power at defined range	Scramble code	Frequency error	Max, avg inactive power
Rel power at defined range	<b>Relative code domain error</b>	EVM	Frequency error
<b>Spurious emissions</b>	Abs/Rel code power	Peak CDE	Time offset, Rho
Peak frequency at defined range	Code error	Carrier feed-through	Carrier feed-through
Peak level at defined range	Individual code EVM, RCDE and its constellation	CPICH absolute power	(Composite) EVM
	Channel power	CPICH relative power	CPICH EVM, P-CCPCH EVM
	Power bar graph	Max inactive power	Amplifier capacity
	(Abs/Rel/Delta power)	Scramble code	Peak amplifier capacity
	CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH	<b>Power statistics CCDF</b>	Average amplifier capacity
	AVG RCDE QPSK, 16 QAM, 64 QAM		Code, peak utilization
			Average utilization
			<b>Route map</b>
			CPICH power, Ec/Io

Longitude, latitude, and satellite in all screens

**cdmaOne/cdma2000® Signal Analyzer (Option 020)****General Parameters**

Frequency range	Band 0 to 10	
Input signal level	-40 to +20 dBm	
RF channel power accuracy	±1.0 dB (typical)	
CDMA compatibility	cdmaOne and cdma2000	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
Rho accuracy	±0.005	0.9 < Rho < 1.0
Residual Rho	>0.995 (typical)	
PN offset	1 x 64 chips	
Code domain power	±0.5 dB relative power ±1.5 dB absolute power	Code channel power >-25 dB Code channel power >-25 dB
Pilot power accuracy	±1.0 dB (typical)	
Time offset	±1.0 μs, ±0.5 μs (typical)	External trigger

**Measurements**

	<b>Option 020</b>		<b>Option 040</b>
<b>Channel power</b>	<b>Constellation</b>	<b>Auto measure</b>	<b>Channel scanner (up to 6)</b>
Channel power	Pilot power	Channel power	Frequencies or channels
Spectral density	Rho	Occupied bandwidth	Channel power, PN offset
Peak to average power	EVM	Spectrum emission mask	Pilot power, Ec/Io
<b>Occupied bandwidth</b>	Frequency error	ACPR	<b>PN scanner (up to 6)</b>
Occupied bandwidth	Time offset	Multi-ACPR	Channel power
Integrated power	Carrier feed-through	Rho	Pilot dominance
Occupied power	PN offset	Frequency error	PN offset
<b>Spectrum emission mask</b>	<b>Code domain power</b>	Time offset	Ec/Io, pilot power, delay
Reference power	Abs/Rel code power	Carrier feed-through	<b>Multipath profile</b>
Peak level at defined range	Channel power	Pilot power	Channel power
<b>ACPR</b>	Power bar graph (Abs/Rel)	Max inactive power	Multipath power
Reference power	Pilot, Paging, Sync, Q-Paging	PN offset	Ec/Io, delay
Abs power at defined range	Max, avg active power	<b>Power statistics CCDF</b>	<b>Code domain power</b>
Rel power at defined range	Max, avg inactive power		Abs/Rel code power
<b>Multi-ACPR</b>	PN offset		Channel power
Lowest reference power	<b>Codogram</b>		PN offset
Highest reference power	Code utilization		Pilot, Paging, Sync, Q-Paging power
Abs power at defined range	<b>RCSI</b>		Max, avg active power
Rel power at defined range	Pilot, Paging, Sync, Q-Paging		Max, avg inactive power
<b>Spurious emissions</b>	<b>CDP table</b>		Frequency error
Peak freq at defined range	Reference power		Time offset, Rho, EVM
Peak level at defined range	Code utilization		Carrier feed-through
	Code, spreading factor		Amplifier capacity
	Allocation (channel type)		Peak amplifier capacity
	Relative, absolute power		Average amplifier capacity
			Code utilization
			Peak utilization
			Average utilization
			<b>Route map</b>
			Pilot power
			Ec/Io

Longitude, latitude, and satellite in all screens

## EV-DO Signal Analyzer (Option 021)

General Parameters		
Frequency range	Band 0 to 10	
Input signal level	-40 to +20 dBm	
RF channel power accuracy	±1.0 dB (typical)	
EV-DO compatibility	Rev 0, Rev A and Rev B	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
Rho accuracy	±0.005	0.9 < Rho < 1.0
Residual Rho	>0.995 (typical)	
PN offset	1 x 64 chips	
Code domain power	±0.5 dB relative power ±1.5 dB absolute power	Code channel power >-25 dB Code channel power >-25 dB
Pilot power accuracy	±1.0 dB (typical)	
Time offset	±1.0 μs, ±0.5 μs (typical)	External trigger

Measurements	Option 021		Option 041
<b>Channel power</b>	<b>Constellation</b>	<b>MAC codogram</b>	<b>Channel scanner (up to 6)</b>
Channel power	<b>(Composite 64/128)</b>	Code utilization	Frequencies or channels
Spectral density	Channel power	<b>RCSI</b>	PN offset
Peak to average power	Rho, EVM, Peak CDE	Slot, pilot, MAC, data	Pilot, MAC, data power
<b>Occupied bandwidth</b>	Frequency error	<b>MAC CDP table</b>	<b>PN scanner (up to 6)</b>
Occupied bandwidth	Time offset	Reference power	Channel power
Integrated power	Carrier feed-through	Code utilization	Pilot dominance
Occupied power	PN offset	Code, spreading factor	PN offset
<b>Spectrum emission mask</b>	Pilot, MAC, data power	Allocation (channel type)	Ec/Io, pilot power, delay
Reference power	Pilot, MAC, data EVM	Relative, absolute power	<b>Multipath profile</b>
Peak level at defined range	<b>Constellation</b>	<b>Auto measure</b>	Channel power
<b>ACPR</b>	<b>(Pilot, MAC 64/128, and data)</b>	Channel power	Multipath power
Reference power	Channel power	Occupied bandwidth	Ec/Io, delay
Abs power at defined range	Rho, EVM, peak CDE	Spectrum emission mask	<b>Code domain power</b>
Rel power at defined range	Frequency error	ACPR	Slot average power
<b>Multi-ACPR</b>	Time offset	Multi-ACPR	PN offset
Lowest reference power	Carrier feed-through	Pilot, MAC, data power	Pilot, MAC, data power
Highest reference power	PN offset	On/off ratio	Pilot, MAC, data Rho
Abs power at defined range	Modulation type*	PvsT mask (idle slot) or	(Composite) EVM
Rel power at defined range	<b>Code Domain Power</b>	PvsT mask (active slot)	Frequency error
<b>Spurious emissions</b>	<b>(Pilot and MAC 64/128)</b>	Frequency error	Time offset
Peak frequency at defined range	Pilot/MAC channel power	Time offset	Carrier feed-through
Peak level at defined range	Slot average power	Carrier feed-through	Max active I/Q power
<b>Power vs. Time</b>	Max active I/Q power	Pilot, MAC, data Rho	Avg active I/Q power
<b>(Idle and Active Slot)</b>	Avg active I/Q power	Max inactive I/Q power	Code utilization
Slot average power	Max inactive I/Q power	PN offset	Peak utilization
On/off ratio	Avg inactive I/Q power	<b>Power statistics CCDF</b>	Average utilization
Idle activity	PN offset		<b>Route Map</b>
Pilot, MAC, data power	<b>Code Domain Power (Data)</b>		Pilot power
	Data channel power		Ec/Io
	Slot average power		
	Max, avg active power		
	Max, avg inactive power		
	PN offset		

Longitude, latitude, and satellite in all screens

\*Measurement is performed in Data Constellation only.



## TD-SCDMA Signal Analyzer (Option 025)

### General Parameters

Frequency range	1.785 GHz to 2.22 GHz	
Input signal level	-40 to +20 dBm	
Channel power (RRC) accuracy	±1.0 dB (typical)	
Modulations	QPSK, 8 PSK, 16 QAM, 64 QAM	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
Residual EVM (RMS)	2.0% (typical)	P-CCPCH slot and 1 channel
Time error (Tau)	±0.2 μs (typical)	External trigger
Spreading factor	Auto (DL, UL), 1, 2, 4, 8, 16	

### Measurements

	Option 025		Option 045
<b>Channel power</b>	Midamble power	<b>Code error</b>	<b>Sync-DL ID scanner (32)</b>
Channel power	(TS [0 to 6], DwPTS, UpPTS)	Code power and error	Scramble code group
Spectral density	Data power right	Individual code EVM	Ec/Io, Tau
Peak to average power	(TS [0 to 6], DwPTS, UpPTS)	and its constellation	DwPTS power
<b>Occupied bandwidth</b>	Time offset	Data format	Pilot dominance
Occupied bandwidth	(TS [0 to 6], DwPTS, UpPTS)	Slot, DwPTS power	<b>Sync-DL ID vs. Tau (up to 6)</b>
Integrated power	<b>Power vs. time (mask)</b>	No. of active code	ID, power, Ec/Io, Tau
Occupied power	Slot power	Scramble code	DwPTS power
<b>Spectrum emission mask</b>	On/off slot ratio	Max active code power	Pilot dominance
Reference power	Off power	Avg active code power	<b>Sync-DL ID multipath</b>
Peak level at defined range	<b>Timogram</b>	Max inactive code power	Ec/Io, Tau
<b>ACLR</b>	<b>Constellation</b>	Avg inactive code power	DwPTS power
Reference power	Rho	Peak CDE and peak active CDE	Pilot dominance
Abs power at defined range	EVM RMS, EVM peak	<b>Auto measure</b>	<b>Sync-DL ID analyzer</b>
Rel power at defined range	Peak CDE	Channel power	DwPTS power, Ec/Io trend
<b>Multi-ACLR</b>	Frequency error	Occupied bandwidth	DwPTS power
Lowest reference power	I/Q origin offset	Spectrum emission mask	Pilot dominance
Highest reference power	Time offset	ACLR	EVM, frequency error
Abs power at defined range	<b>Midamble power</b>	Multi-ACLR	Ec/Io, CINR
Rel power at defined range	Slot power	Slot power	<b>Route Map</b>
<b>Spurious emissions</b>	DwPTS power	DwPTS power	DwPTS Power
Peak frequency at defined range	Midamble power (1 to 16)	UpPTS power	
Peak level at defined range	<b>Code power</b>	On/off slot ratio	
<b>Power vs. time (slot)</b>	Abs/Rel code power	Frequency error	
Slot power	Individual code EVM	EVM RMS	
DwPTS power	and its constellation	Peak CDE	
UpPTS power	Data format	Max inactive power	
On/off slot ratio	Slot power, DwPTS power	Scramble code	
Slot PAR	No. of active code		
DwPTS code	Scramble code		
<b>Power vs. time (frame)</b>	Max active code power		
Slot power	Avg active code power		
(TS [0 to 6], DwPTS, UpPTS)	Max inactive code power		
Data power left	Avg inactive code power		
(TS [0 to 6], DwPTS, UpPTS)			

## Mobile WiMAX Signal Analyzer (Option 026)

### General Parameters

Frequency range	2.1 GHz to 2.7 GHz 3.4 GHz to 3.85 GHz	
Input signal level	-40 to +20 dBm	
Channel power accuracy	±1.0 dB (typical)	
Supported bandwidth	7 MHz, 8.75 MHz, and 10 MHz	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
Residual EVM (RMS)	1.5% (typical)	

### Measurements

	Option 026		Option 046
<b>Channel power</b>	<b>Constellation</b>	<b>Auto measure</b>	<b>Preamble scanner (up to 6)</b>
Channel power	Channel power	Channel power	Total preamble power
Spectral density	RCE RMS, RCE peak	Occupied bandwidth	Preamble, relative power
Peak to average power	EVM RMS, EVM peak	Spectrum emission mask	Cell ID, sector ID
<b>Occupied bandwidth</b>	Frequency error	Spurious emission mask	Time offset
Occupied bandwidth	Time offset	Preamble power	<b>Multipath profile</b>
Integrated power	Segment ID, cell ID	DL burst power	Total preamble power
Occupied power	Preamble index	UL burst power	Multipath power
<b>Spectrum emission mask</b>	<b>Spectral flatness</b>	Frame average power	Relative power, delay
Reference power	Average subcarrier power	Time offset	<b>Preamble power trend</b>
Peak level at defined range	Subcarrier power variation	I/Q origin offset	Preamble power trend
<b>Spurious emissions</b>	Max, min, avg power	Spectral flatness	Relative power trend
Peak frequency at defined range	<b>EVM vs. subcarrier</b>	Frequency error	Preamble power
Peak level at defined range	RCE RMS, RCE peak	RCE RMS	Frame avg power
<b>Power vs. time (frame)</b>	EVM RMS, EVM peak	RCE peak	Relative power
Channel power	Segment ID, cell ID	EVM RMS	C/I
Frame average power	Preamble index	EVM peak	Preamble
Preamble power	<b>EVM vs. symbol</b>	<b>Power statistics CCDF</b>	Cell ID, sector ID
DL burst power	RCE RMS, RCE peak		Time offset
UL burst power	EVM RMS, EVM peak		<b>Route map</b>
I/Q origin offset	Segment ID, cell ID		Preamble power
Time offset	Preamble index		

Longitude, latitude, and satellite in all screens

## LTE-FDD Signal Analyzer (Option 028)

General Parameters	
Frequency range	Band 1 to 14, 17 to 26
Input signal level	-40 to +20 dBm
Channel power accuracy	±1.0 dB (typical)
Supported bandwidths	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz
Frequency error	±10 Hz + ref freq accuracy
Residual EVM (RMS)	2.0% (typical)
	99% confidence level
	Data EVM

  

Measurements	
	<b>Option 028</b>
<b>Channel power</b>	I/Q diagram
Channel power	RB power
Spectral density	Modulation format
Peak to average power	I/Q origin offset
<b>Occupied bandwidth</b>	EVM RMS, EVM peak
Occupied bandwidth	<b>Control channel</b>
Integrated power	Control channel summary
Occupied power	(P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*)
<b>Spectrum emission mask</b>	EVM, relative or absolute power, modulation type
Reference power	Each control channels'
Peak level at defined range	I/Q diagram
<b>ACLR</b>	Modulation format
Reference power	Frequency error
Abs power at defined range	I/Q origin offset
Rel power at defined range	EVM RMS, EVM peak
<b>Multi-ACLR</b>	<b>Subframe</b>
Lowest reference power	MBSFN*
Highest reference power	Subframe summary table
Abs power at defined range	(P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/Data*
Rel power at defined range	QPSK, PDSCH/Data* 16 QAM, PDSCH/Data* 64 QAM)
<b>Spurious emissions</b>	EVM, relative or absolute power, modulation type
Peak frequency at defined range	Subframe power
Peak level at defined range	OFDM symbol power
<b>Power vs. time (frame)</b>	Frequency, time error
Frame average power	Data EVM RMS, peak
Subframe power	RS EVM RMS, peak
First slot power	Cell, group, sector ID
Second slot power	<b>Frame</b>
Cell ID, I/Q origin offset	MBSFN*
Time offset	Frame summary table
<b>Constellation</b>	(P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/Data*
MBSFN*	QPSK, PDSCH/Data* 16 QAM, PDSCH/Data* 64 QAM)
RS TX power	EVM, relative or absolute power, modulation type
PDSCH/Data* QPSK EVM	Frame average power
PDSCH/Data* 16 QAM EVM	OFDM symbol power
PDSCH/Data* 64 QAM EVM	Frequency error
Data EVM RMS	
Data EVM peak	
Frequency error	
Time error	
<b>Data channel</b>	
MBSFN*	
Resource block power	
	<b>Option 048</b>
	<b>ID scanner (up to 6)</b>
	RSRP/RSRQ dominance
	S-SS RSSI dominance
	S-SS Ec/Io dominance
	Cell, group, sector ID
	RSRP/RSRQ
	RS-SINR/S-SS RSSI
	P-SS/S-SS Power
	S-SS Ec/Io
	<b>Multipath profile</b>
	Cell, group, sector ID
	Ant 0 RS Ec/Io, delay
	Ant 1 RS Ec/Io, delay
	Ant 0 Sync Ec/Io, delay
	Ant 1 Sync Ec/Io, Delay
	<b>Control channel</b>
	RS power trend
	Cell, group, sector ID
	Control channel table
	(P-SS, S-SS, PBCH, PCFICH, RS 0, RS 1)
	Absolute power
	Relative power
	EVM RSM, phase
	Frequency error
	Time alignment error
	Time offset
	<b>Datagram</b>
	Datagram
	Resource block power
	Data utilization
	<b>Route Map</b>
	RSRP
	RSRQ
	RS-SINR
	S-SS RSSI
	P-SS, S-SS power
	S-SS Ec/Io
	<b>Time alignment error</b>
	Time alignment error trend
	Time alignment error
	RS power difference
	Antenna 0 RS power
	Antenna 0 RS EVM
	Antenna 1 RS power
	Antenna 1 RS EVM
	Cell, group, sector ID
	<b>Data allocation map</b>
	Data allocation vs frame
	Resource block power
	OFDM symbol power
	Data utilization
	Data allocation vs subframe
	Resource block power
	Data utilization
	<b>Auto measure</b>
	Channel power
	Occupied bandwidth
	Spectrum emission mask
	ACLR
	Multi-ACLR
	Spurious emission mask
	Frame average power
	Time alignment error
	Frequency error
	MBSFN*
	PDSCH/Data* QPSK EVM
	PDSCH/Data* 16 QAM EVM
	PDSCH/Data* 64 QAM EVM
	Data EVM RMS, peak
	RS, P-SS, S-SS EVM
	RS, P-SS, S-SS power
	PBCH power
	Subframe power
	OFDM power
	Time error
	I/Q origin offset
	<b>Power statistics CCDF</b>

Longitude, latitude, and satellite in all screens

\* Measurement is performed when MBMS is enabled.

**LTE-TDD Signal Analyzer (Option 029)**

General Parameters		
Frequency range	Band 33 to 43	
Input signal level	-40 to +20 dBm	
Channel power accuracy	±1.0 dB (typical)	
Supported bandwidth	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
Residual EVM (RMS)	2.0% (typical)	Data EVM

Measurements	Option 029	Option 049
<b>Channel power</b>	Data EVM RMS	<b>ID scanner (up to 6)</b>
Channel power	Data EVM peak	RSRP/RSRQ dominance
Spectral density	Frequency error	S-SS RSSI dominance
Peak to average power	Time error	S-SS Ec/Io dominance
<b>Occupied bandwidth</b>	<b>Data channel</b>	Cell, group, sector ID
Occupied bandwidth	MBSFN*	RSRP/RSRQ
Integrated power	Resource block power	RS-SINR/S-SS RSSI
Occupied power	I/Q diagram	P-SS/S-SS power
<b>Spectrum emission mask</b>	RB power	S-SS Ec/Io
Reference power	Modulation format	<b>Multipath profile</b>
Peak level at defined range	I/Q origin offset	Cell, group, sector ID
<b>ACLR</b>	EVM RMS, EVM peak	Ant 0 RS Ec/Io, delay
Reference power	<b>Control channel</b>	Ant 1 RS Ec/Io, delay
Abs power at defined range	Control channel summary	Ant 0 Sync Ec/Io, Delay
Rel power at defined range	(P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*)	Ant 1 Sync Ec/Io, Delay
<b>Multi-ACLR</b>	EVM, relative or absolute power, modulation type	<b>Control channel</b>
Lowest reference power	Each control channels'	RS power trend
Highest reference power	I/Q diagram	Cell, group, sector ID
Abs power at defined range	Modulation format	Control channel table
Rel power at defined range	Frequency error	(P-SS, S-SS, PBCH, PCFICH, RS 0, RS 1)
<b>Spurious emissions</b>	I/Q origin offset	Absolute power
Peak frequency at defined range	EVM RMS, EVM peak	Relative power
Peak level at defined range	<b>Subframe</b>	EVM RSM, phase
<b>Power vs. time (frame)</b>	MBSFN*	Frequency error
Frame average power	Subframe summary table	Time alignment error
Subframe power	(P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/Data*	Time offset
First slot power	QPSK, PDSCH/Data* 16 QAM, PDSCH/Data* 64 QAM)	<b>Datagram</b>
Second slot power	EVM, relative or absolute power, modulation type	Datagram
Cell ID, I/Q origin offset	Subframe power	Resource block power
Time offset	OFDM symbol power	Data utilization
<b>Power vs. time (slot)</b>	Frequency, time error	<b>Route Map</b>
Slot average power	Data EVM RMS, peak	RSRP
Transient period length	RS EVM RMS, peak	RSRQ
Off power	Cell, group, sector ID	RS-SINR
<b>Constellation</b>		S-SS RSSI
MBSFN*		P-SS, S-SS power
RS TX power		S-SS Ec/Io
PDSCH/Data* QPSK EVM		
PDSCH/Data* 16 QAM EVM		
PDSCH/Data* 64 QAM EVM		

Longitude, latitude, and satellite in all screens

\* Measurement is performed when MBMS is enabled.

## 13

**E1 Analyzer (Option 004)****Electrical Interface**

Connectors RX/TX	RJ45 (120 Ω)
Output	0 dB, -6 dB (ITU-T Rec.G.703)
Line code	AMI, HDB3
Impedance	Term, monitor 120 Ω, bridge >1000 Ω

**Input**

Term/bridge/monitor	0 to -20 dB
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**Transmitter and Receiver**

Framing	PCM-30, PCM-30 with CRC PCM-31, PCM-31 with CRC
Channel formats	Full E1
Test pattern	1-4, 1-8, ALL1, ALL0, 0101

**Additional Functions**

Reference clock	Received or internal
Event log capability	Internal memory
Error insertion	1, 1E-3, 1E-4, 1E-5
Error rate count	CRC, Frame, Code, Bit

**Measurements****Monitoring**

Indicators
E1 signal
Frame sync
Pattern sync
Code sync
FAS RAI
AIS
HDB3
Bit error <sup>2</sup>

**Error count/rate**

Frame error
Code error
Bit error <sup>2</sup>

**Alarm count**

FAS
AIS

**Loss count**

Frame sync
Pattern sync

**BERT**

Indicators
E1 signal
Frame sync
Pattern sync
Code sync
FAS RAI
AIS
HDB3
Bit error <sup>2</sup>

**Error count/rate**

CRC error <sup>1</sup>
Frame error
Code error
Bit error <sup>2</sup>

**Alarm count**

FAS
AIS

**Loss count**

Frame sync
Pattern sync

1. When CRC-4 is set to On.
2. When PCM31 is set to On.

**T1 Analyzer (Option 005)****Electrical Interface**

Connectors RX/TX	RJ45 (120 Ω)
Output	0 dB, -7.5 dB, -15 dB
Line code	AMI, B8ZS
Impedance	100 Ω or 1000 Ω (bridge)

**Input**

Term/bridge/monitor	0 to -20 dB
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**Transmitter and Receiver**

Framing	D4, ESF
Channel formats	Full T1
Test pattern	1-8, 1-16, ALL1, ALL0, 0101 2E-24, QRSS, 2E-23, 2E-15, 2E-23 inverse, 2E-15 inverse

**Additional Functions**

Reference clock	Received or internal
Event log capability	Internal memory
Error insertion	1, 1E-3, 1E-4, 1E-5
Alarm insertion	AIS, RAI
Error/alarm count	Bit RAI, AIS, BPV, BER
Loopback modes	Self, CSU, NIU, line, network

**Measurements****Monitoring/BERT/loop test**

Indicators
T1 signal
Frame sync
Pattern sync
B8ZS
Red alarm
RAI (yellow alarm)
AIS (blue alarm)
BPV indicator

**Loss count**

Signal loss
Frame sync loss
Pattern sync loss

**RX signal level**

Indicators
T1 signal
Frame sync
Pattern sync
B8ZS
Red alarm
RAI (yellow alarm)
AIS (blue alarm)
BPV indicator

**Vp-p**

Vp-p Max
Vp-p Min
dB <sub>dsx</sub>

**Alarm count**

RAI
AIS
BPV

**Error rate**

Bit error rate
Bit error count

## General Information

### Inputs and Outputs

<b>RF in</b>	Spectrum analyzer
Connector	Type-N, female
Impedance	50 $\Omega$ (nominal)
Damage level	>+40 dBm, $\pm$ 50 VDC (nominal)

### Reflection/RF out

Connector	Type-N, female
Impedance	50 $\Omega$ (nominal)
Damage level	>+37 dBm, $\pm$ 50 VDC (nominal)

### RF in

Connector	Type-N, female
Impedance	50 $\Omega$ (nominal)
Maximum level	>+25 dBm, $\pm$ 50 VDC (nominal)

### External trigger, GPS

Connector	SMA, female
Impedance	50 $\Omega$ (nominal)

### External ref

Connector	SMA, female
Impedance	50 $\Omega$ (nominal)
Input frequency	10 MHz, 13 MHz, 15 MHz
Input range	-5 to +5 dBm

### USB

USB host <sup>1</sup>	Type A, 1 port
USB client <sup>2</sup>	Type B, 1 port

LAN	RJ45, 10/100Base-T
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E1/T1	RJ45
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Audio jack	3.5 mm headphone jack
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External power	5.5 mm barrel connector
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Speaker	Built-in speaker
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### Display

Type	Resistive touch screen (as of serial number BEK11791)
Size	8 inch, LED backlight
Resolution	800 x 600

### Power

External DC input	12 to 19 VDC
Power consumption	32.5 W      45 W maximum (when charging battery)

### Battery

Type	10.8 V, 7800 mA/hr (Lithium ion)
Operating time	>3 hours (typical)
Charge time	2.5 hours (80%), 4 hours (100%)
Charging temperature	0° to 45 °C (32° to 113 °F) $\leq$ 85% RH
Discharging temperature	-10° to 60 °C (14° to 140 °F) $\leq$ 85% RH
Storage temperature <sup>3</sup>	-20° to 50 °C (-4° to 122 °F) $\leq$ 85% RH (non-condensing)

### Data Storage

Internal <sup>4</sup>	Minimum 20 MB
External <sup>5</sup>	Limited by size of USB flash drive

### Environmental

#### Operating temperature

AC Power	0° to 40°C (32° to 104°F) with no derating
Battery	0° to 40°C (32° to 104°F) @charging -10° to 55°C (14° to 131°F) @discharging

Maximum humidity	$\leq$ 85% RH (non-condensing)
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Shock and vibration	MIL-PRF-28800F Class 2
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Storage temperature <sup>6</sup>	-55° to 71°C (-67° to 160°F)
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### EMC

EN 61326-2-1	Complies with European EMC
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### Size and Weight (Standard configuration)

Weight (with battery)	<4 kg (8.8 lb)
Size (W x H x D)	295 x 195 x 82 mm (11.6 x 7.7 x 3.2 in)

### Warranty

2 years

### Calibration Cycle

1 year

1. Connects flash drive and power sensor.
2. Connects to PC for data transfer.
3. 20 to 85% RH, store battery pack in low-humidity environment.  
Extended exposure to temperature above 45°C could significantly degrade battery performance and life.
4. Up to 700 traces.
5. Supports USB 2.0 compatible memory devices.
6. With the battery pack removed.

## Ordering Information

**Standard**

JD745A	100 kHz to 4 GHz Spectrum Analyzer 5 MHz to 4 GHz Cable and Antenna Analyzer <sup>1</sup> 10 MHz to 4 GHz RF Power Meter (Internal mode)
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**Options**

*NOTE: Upgrade options for the JD745A use the designation JD745AU before the respective last three-digit option number.*

JD745A001	2-Port Transmission Measurement <sup>2</sup>	
JD745A002	Bias-Tee	(requires option 01)
JD745A003	CW Signal Generator	
JD745A004	E1 Analyzer <sup>3</sup>	
JD745A005	T1 Analyzer <sup>3</sup>	
JD745A010	GPS Receiver and Antenna	
JD745A011	Interference Analyzer <sup>4,5</sup>	
JD745A012	Channel Scanner	
JD745A013	Optical Power Meter <sup>6</sup>	
JD745A020	cdmaOne/cdma2000 Signal Analyzer	
JD745A021	EV-DO Signal Analyzer	(requires option 20)
JD745A022	GSM/GPRS/EDGE Signal Analyzer	
JD745A023	WCDMA/HSPA+ Signal Analyzer	
JD745A025	TD-SCDMA Signal Analyzer	
JD745A026	Mobile WiMAX Signal Analyzer	
JD745A028	LTE-FDD Signal Analyzer	
JD745A029	LTE-TDD Signal Analyzer	
JD745A040	cdmaOne/cdma2000 OTA Analyzer <sup>5</sup>	(requires option 10)
JD745A041	EV-DO OTA Analyzer <sup>5</sup>	(requires option 10)
JD745A042	GSM/GPRS/EDGE OTA Analyzer <sup>5</sup>	(requires option 10)
JD745A043	WCDMA/HSPA+ OTA Analyzer <sup>5</sup>	(requires option 10)
JD745A045	TD-SCDMA OTA Analyzer <sup>5</sup>	(requires option 10)
JD745A046	Mobile WiMAX OTA Analyzer <sup>5</sup>	(requires option 10)
JD745A048	LTE-FDD OTA Analyzer <sup>5</sup>	(requires option 10)
JD745A049	LTE-TDD OTA Analyzer <sup>5</sup>	(requires option 10)

**Standard Accessories**

G710550326	AC/DC power adapter <sup>7</sup>
G710550335	Cross LAN cable (1.5 m) <sup>7</sup>
GC73050515	USB A to B cable (1.8 m) <sup>7</sup>
GC72450518	>1 G Byte USB memory <sup>7</sup>
G710550325	Rechargeable lithium ion battery <sup>7</sup>
G710550323	Automotive cigarette lighter 12 VDC adapter <sup>7</sup>
G710550316	Stylus pen <sup>7</sup>
JD740A361	JD740A series user's manual and application software — CD

1. Requires calibration kit.
2. Requires dual-port calibration kit.
3. Requires test cable.
4. Highly recommend adding JD745A010.
5. Highly recommend adding G70005035x and/or G70005036x.
6. Requires MP-60 or MP-80.
7. Standard accessories can be purchased separately.

**Optional Calibration Kits**

JD72450509	Y-calibration kit, Type-N(m), DC to 6 GHz, 50 Ω
JD72450510	Y-calibration kit DIN(m), DC to 4 GHz, 50 Ω
JD71050507	Dual-port Type-N calibration kit, 50 Ω <ul style="list-style-type: none"> <li>• Y-calibration kit, Type-N(m), DC to 4 GHz, 50 Ω</li> <li>• Two adapters Type-N(f) to Type-N(f), DC to 4 GHz, 50 Ω</li> <li>• Two 1 m RF test cables, Type-N(m) to Type-N(m), DC to 18 GHz, 50 Ω</li> </ul>
JD71050508	Dual-Port DIN calibration kit, 50 Ω <ul style="list-style-type: none"> <li>• Y-calibration kit DIN(m), DC to 4 GHz, 50 Ω</li> <li>• Two 1 m RF test cables, Type-N(m) to Type-N(m), DC to 18 GHz, 50 Ω</li> <li>• Adapter Type-N(f) to DIN(f), DC to 4 GHz, 50 Ω</li> <li>• Adapter Type-N(f) to DIN(m), DC to 4 GHz, 50 Ω</li> <li>• Adapter DIN(f) to DIN(f), DC to 4 GHz, 50 Ω</li> <li>• Adapter DIN(m) to DIN(m), DC to 4 GHz, 50 Ω</li> </ul>

**Optional RF Cables**

G710050530	1.0 m (3.28 ft) RF cable, DC to 18 GHz, Type-N(m) to Type-N(m), 50 Ω
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
G710050533	1.5 m (4.92 ft) RF cable, DC to 18 GHz, Type-N(m) to SMA(m), 50 Ω
G710050534	1.5 m (4.92 ft) RF cable, DC to 18 GHz, Type-N(m) to QMA(m), 50 Ω
G710050535	1.5 m (4.92 ft) RF cable, DC to 18 GHz, Type-N(m) to SMB(m), 50 Ω

**Ordering Information (cont'd)**
**Optional Omni Antennas**

G700050351	RF omni antenna Type-N(m), 400 MHz to 450 MHz
G700050352	RF omni antenna Type-N(m), 450 MHz to 500 MHz
G700050353	RF omni antenna Type-N(m), 806 MHz to 896 MHz
G700050354	RF omni antenna Type-N(m), 870 MHz to 960 MHz
G700050355	RF omni antenna Type-N(m), 1.71 GHz to 2.17 GHz
G700050356	RF omni antenna Type-N(m), 720 MHz to 800 MHz
G700050357	RF omni antenna Type-N(m), 2.3 GHz to 2.7 GHz

**Optional Yagi Antennas**

G700050364	RF Yagi antenna Type-N(f), 806 MHz to 896 MHz, 10.2 dBd
G700050365	RF Yagi antenna Type-N(f), 866 MHz to 960 MHz, 10.2 dBd
G700050363	RF Yagi antenna Type-N(f), 1.75 GHz to 2.39 GHz, 9.8 dBd
G700050366	RF Yagi antenna SMA(f), 700 MHz to 4 GHz, 1.85 dBd

**Optional RF Power Sensors**

JD731B	Directional Power Sensor (peak and average power) Frequency: 300 MHz to 3.8 GHz Power: average 0.15 to 150 W, Peak 4 to 400 W
JD733A	Directional Power Sensor (peak and average power) Frequency: 150 MHz to 3.5 GHz Power: average/peak 0.1 to 50 W
JD732B	Terminating Power Sensor (average power) Frequency: 20 MHz to 3.8 GHz Power: -30 to +20 dBm
JD734B	Terminating Power Sensor (peak power) Frequency: 20 MHz to 3.8 GHz Power: -30 to +20 dBm
JD736B	Terminating Power Sensor (peak and average power) Frequency: 20 MHz to 3.8 GHz Power: -30 to +20 dBm

**Optional Optical Power Sensors**

MP-60	Miniature USB 2.0 Optical Power Sensor Wavelength range: 780 to 1650 nm 1300, 1310, 1490, 1550 nm: -50 to +10 dBm 850 nm: -45 to +10 dBm
MP-80	Miniature USB 2.0 Optical Power Sensor Wavelength range: 780 to 1650 nm 1300, 1550 nm: -35 to +23 dBm 850 nm: -30 to +23 dBm

**Optional RF Adapters**

G710050570	Adapter Type-N(f) to Type-N(f), DC to 6 GHz, 50 Ω
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 E1/T1 Test Cables**

G710050317	RJ45 to Y Bantam cable
G710050318	RJ45 to Y BNC cable
G710050319	RJ45 to 4 alligator clips

**Optional Miscellaneous**

G710050581	Attenuator 40 dB, 100 W, DC to 4 GHz (unidirectional)
JD74050341	Soft carrying case
JD71050342	Hard carrying case
JD74050343	Backpack carrying case
G710050585	RF directional coupler, 700 MHz to 4 GHz, 30 dB, Input/Output; Type-N(m) to Type-N(f), Tap Off; Type-N(f) <sup>8</sup>
G710050586	RF combiner, 700 MHz to 4 GHz, Type-N(f) to Type-N(m) <sup>8</sup>
G71050324	External battery charger
JD740A362	JD740A series user's manual – printed version

8. Highly recommended for LTE testing.

**Test & Measurement Regional Sales**

<b>NORTH AMERICA</b> TOLL FREE: 1 855 ASK-JDSU 1 855 275-5378	<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	<b>www.jdsu.com/test</b>
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