JD7105B

Base Station Analyzer

Spectrum Analyzer: 100 kHz to 7.2 GHz

Cable and Antenna Analyzer: 25 MHz to 4 GHz

Power Meter: 10 MHz to 7.2 GHz

Specification Conditions

The JD7105B specifications apply under these conditions:

- After a 30-minute warm-up, 2 hours of operation.
- 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 OSL Standard.
- "Typical" or "Nominal" values are defined as:
  - Typical: Expected performance of the instrument operating under 20 to 30°C after being at this temperature for 2 hours
  - Nominal: A general, descriptive term or parameter

*All specifications subject to change without notice.

Spectrum Analyzer (Standard)

Frequency	
Frequency range	100 kHz to 7.2 GHz

Internal 10 MHz Frequency Reference	
Accuracy	±0.1 ppm + aging (0 to 50°C)
Aging	±0.25 ppm/year

Frequency Span	
Range	0 Hz (zero span) 10 Hz to 7.2 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	< –100 dBc/Hz (typical)
100 kHz	< –102 dBc/Hz (typical)
1 MHz	< –115 dBc/Hz (typical)

Measurement Range	
	DANL to +30 dBm
Input attenuator range	0 to +55 dB, 5 dB steps

Maximum Input Level	
Average continuous power	+30 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 1 GHz	–145 dBm
> 1 GHz to 2 GHz	–143 dBm
> 2 GHz to 3 GHz	–140 dBm
> 3 GHz to 6 GHz	–135 dBm
> 6 GHz to 7.2 GHz	–130 dBm
Preamplifier On:	
10 MHz to 1 GHz	–160 dBm
> 1 GHz to 2 GHz	–158 dBm
> 2 GHz to 3 GHz	–156 dBm
> 3 GHz to 6 GHz	–154 dBm
> 6 GHz to 7.2 GHz	–145 dBm

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)		
10 MHz to 4.35 GHz	±1.00 dB (typical)	
> 4.35 GHz to 5.75 GHz	±1.25 dB (typical)	Attenuation ≤ 40 dB
	±1.75 dB (typical)	Attenuation > 40 dB
> 5.75 GHz to 7.20 GHz	±1.50 dB (typical)	Attenuation ≤ 40 dB
	±2.00 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	
10 MHz to 7.2 GHz	1.5:1 (typical)

Second Harmonic Distortion (Second Harmonic Intercept: SHI)	
Mixer level = –25 dBm	
100 kHz to 1 GHz	< –65 dBc (typical)
> 1 GHz to 7.2 GHz	< –70 dBc (typical)

Third-order Inter-modulation (Third-order Intercept: TOI)	
1 GHz	+12 dBm (typical)
2 GHz	+15 dBm (typical)

Spurious	
Inherent residual response	
Input terminated, 0 dB attenuation, preamplifier off, RBW at 10 kHz	
100 kHz to 3.2 GHz	–90 dBm (nominal)
> 3.2 GHz to 7.2 GHz	–85 dBm (nominal)
Exceptions	< –75 dBm at 4281 to 4292 MHz < –60 dBm at 95.836 and 191.672 MHz
Input-related spurious	< –70 dBc (nominal)
Exceptions	–50 dBc at 175 MHz ±0.8 MHz

Dynamic Range	
2/3 (TOI-DANL) in 1Hz RBW	> 95 dB

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
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

*CW Signal Generator can be set up simultaneously.

Cable and Antenna Analyzer (Standard)

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

Data Points	
	126, 251, 501, 1001
Measurement speed	
1-Port measurements	2 ms/point (nominal)
2-Port measurements	5 ms/point (nominal)

Measurement Accuracy	
Corrected directivity	40 dB (typical)
Reflection uncertainty	$\pm(0.3 + \lvert 20\log(1+10^{-EP/20})\rvert)$ (typical) EP = Directivity – Measured return loss

Output Power	
High	+3 dBm (typical)
Low	–30 dBm (typical)
Signal source setting	+3 dBm –20 to -70 dBm, 10 dB steps
Accuracy	±1.5 dB (15 to 35°C)

Dynamic Range		
Reflection		60 dB
Transmission	25 MHz to 3.5 GHz	80 dB
	> 3.5 GHz to 4.0 GHz	75 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	
Reflection (VSWR)	
VSWR range	1 to 65
Return loss range	0 to 60 dB
Resolution	0.01
Distance to Fault (DTF)	
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	$(1.5\times10^{8})\times(V_p)/(\text{Delta})\times(0.95)$ V_p = Propagation Velocity Delta = Stop Freq-Start Freq[Hz]
Cable Loss (1-port)	
Range	0 to 30 dB
Resolution	0.01 dB
Insertion Loss/Gain	
Range	–120 to 100 dB
Resolution	0.01 dB
Phase (1- and 2-port)	
Range	–180° to +180°
Resolution	0.01°
Smith Chart	
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 7.2 GHz
Span	100 kHz to 100 MHz
Dynamic range	–120 to +30 dBm
Maximum power	+30 dBm
Accuracy	Same as spectrum analyzer

External RF Power Sensors	
Directional power sensor	**JD731B**
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)[1,2]
Directional power sensor	**JD733A**
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)[1,2]
Terminating power sensor	**JD732A**
Frequency range	20 MHz to 3.8 GHz
Dynamic range	–30 to +20 dBm
Connector type	Type-N male
Measurement type	Average
Accuracy	±7%[1]
Terminating power sensor	**JD734A**
Frequency range	20 MHz to 3.8 GHz
Dynamic range	–30 to +20 dBm
Connector type	Type-N male
Measurement type	Peak
Accuracy	±7%[1]
Terminating power sensor	**JD736A**
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%[1]

1. CW condition at 25°C ±10°C
2. Foward power

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	

Interference Analyzer (Option 011)

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

Channel Scanner (Option 012)

Frequency Range	
	10 MHz to 7.2 GHz

Measurement Range	
	–110 to +30 dBm

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

Bias-Tee (Option 013)

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

Power
16 W Max

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 +30 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
Channel power	***Constellation***	***Auto measure***	***Channel/frequency scanner***
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)
Occupied bandwidth	Phase error RMS	Burst power	BSIC (NCC, BCC)
Occupied bandwidth	Phase error peak	PvsT – Mask	***Multipath profile***
Integrated power	IQ origin offset*	Frame average power	(10 strongest)
Occupied power	TSC	Frequency error	Frame average power
Spectrum emission mask	BSIC	Phase error RMS	SNR, delay
Reference power	C/I*	Phase error peak	***Modulation analyzer***
Peak level at defined range	EVM RMS*	EVM RMS*	Frame avg power trend
Spurious emissions	EVM Peak*	EVM Peak*	C/I trend
Peak frequency at defined range	EVM 95th*	IQ origin offset	Frame average power
Peak level at defined range		C/I*	BSIC, frame no. and time
Power vs. time (Slot)			C/I, frequency error
Burst power			Burst power
Max/min point			Modulation type
Power vs. time (Frame)			
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/HSDPA Signal Analyzer (Option 023 for WCDMA, Option 024 for HSDPA)

General Parameters		
Frequency range	Band 1 to Band 14	
Input signal range	–40 to +30 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	
HSDPA 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

Option 023 and 024

Channel power
Channel power
Spectral density
Peak to average power

Occupied bandwidth
Occupied bandwidth
Integrated power
Occupied power

Spectrum emission mask
Reference power
Peak level at defined range

ACLR
Reference power
Abs power at defined range
Rel power at defined range

Multi-ACLR
Lowest reference power
Highest reference power
Abs power at defined range
Rel power at defined range

Spurious emissions
Peak freq at defined range
Peak level at defined range

Constellation
CPICH power
Rho, EVM
Peak CDE
Frequency error
Time offset
Carrier feed-through
Scramble code

Code domain power
Abs/Rel code power
Individual code EVM and its constellation
Channel power
Power bar graph (Abs/Rel/Delta power)
CPICH, P-CCPCH, S-CCPCH
PICH, P-SCH, S-SCH
Max, avg active power
Max, avg inactive power
Scramble code

Codogram
Code utilization

RCSI
CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH

CDP table
Reference power
Code utilization
Code, spreading factor
Allocation (channel type)
EVM, modulation type
Relative, absolute power

Auto measure
Channel power
Occupied bandwidth
Spectrum emission mask
ACLR
Multi-ACLR
Frequency error
EVM
Peak CDE
Carrier feed-through
CPICH absolute power
CPICH relative power
Max inactive power
Scramble code

Power statistics CCDF

Option 043

Channel scanner (up to 6)
Frequencies or channels
Channel power, scramble code, CPICH power, Ec/Io

Scramble scanner (up to 6)
Channel power
CPICH dominance
Scramble code
Ec/Io, CPICH power, delay

Multipath profile
Channel, multipath power
Ec/Io, delay

Code domain power
Abs/Rel code power
Individual code EVM
Channel power
Scramble code
CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH
Max, avg active power
Max, avg inactive power
Frequency error
Time offset, Rho
Carrier feed-through
(Composite) EVM
CPICH EVM, P-CCPCH EVM
Amplifier capacity
Peak amplifier capacity
Average amplifier capacity
Code, peak utilization
Average utilization

Longitude, latitude, and satellite in all screens

cdmaOne/cdma2000® Signal Analyzer (Option 020)

General Parameters		
Frequency range	Band 0 to Band 10	
Input signal level	–40 to +30 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

Option 020

Channel power
Channel power
Spectral density
Peak to average power

Occupied bandwidth
Occupied bandwidth
Integrated power
Occupied power

Spectrum emission mask
Reference power
Peak level at defined range

ACPR
Reference power
Abs power at defined range
Rel power at defined range

Multi-ACPR
Lowest reference power
Highest reference power
Abs power at defined range
Rel power at defined range

Spurious emissions
Peak freq at defined range
Peak level at defined range

Constellation
Pilot power
Rho
EVM
Frequency error
Time offset
Carrier feed-through
Pn offset

Code domain power
Abs/Rel code power
Channel power
Power bar graph (Abs/Rel)
Pilot, Paging, Sync,Q-Paging
Max, avg active power
Max, avg inactive power
PN offset

Codogram
Code utilization

RCSI
Pilot, Paging, Sync,Q-Paging

CDP table
Reference power
Code utilization
Code, spreading factor
Allocation (channel type)
Relative, absolute power

Auto measure
Channel power
Occupied bandwidth
Spectrum emission mask
ACPR
Multi-ACPR
Rho
Frequency error
Time offset
Carrier feed-through
Pilot power
Max inactive power
PN offset

Power statistics CCDF

Option 040

Channel scanner (up to 6)
Frequencies or channels
Channel power, PN offset
Pilot power, Ec/Io

PN scanner (up to 6)
Channel power
Pilot dominance
PN offset
Ec/Io, pilot power, delay

Multipath profile
Channel power
Multipath power
Ec/Io, delay

Code domain power
Abs/Rel code power
Channel power
PN offset
Pilot, Paging, Sync, Q-Paging power
Max, avg active power
Max, avg inactive power
Frequency error
Time offset, Rho, EVM
Carrier feed-through
Amplifier capacity
Peak amplifier capacity
Average amplifier capacity
Code utilization
Peak utilization
Average utilization

Longitude, latitude, and satellite in all screens

EV-DO Signal Analyzer (Option 021)

General Parameters		
Frequency range	Band 1 to Band 10	
Input signal level	–40 to +30 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
Channel power	***Constellation***	***MAC codogram***	***Channel scanner (up to 6)***
Channel power	***(Composite 64/128, pilot, MAC***	Code utilization	Frequencies or channels
Spectral density	***64/128, data)***	***RCSI***	PN offset
Peak to average power	Channel power	Slot, pilot, MAC, data	Pilot, MAC, data power
Occupied bandwidth	Rho, EVM, Peak CDE	***MAC CDP table***	***PN scanner (up to 6)***
Occupied bandwidth	Frequency error	Reference power	Channel power
Integrated power	Time offset	Code utilization	Pilot dominance
Occupied power	Carrier feed-through	Code, spreading factor	PN offset
Spectrum emission mask	PN offset	Allocation (channel type)	Ec/Io, pilot power, delay
Reference power	Modulation type*	Relative, absolute power	***Multipath profile***
Peak level at defined range	***Code Domain Power***	***Auto measure***	Channel power
ACPR	***(Pilot and MAC 64/128)***	Channel power	Multipath power
Reference power	Pilot/MAC channel power	Occupied bandwidth	Ec/Io, delay
Abs power at defined range	Slot average power	Spectrum emission mask	***Code domain power***
Rel power at defined range	Max active I/Q power	ACPR	Slot average power
Multi-ACPR	Avg active I/Q power	Multi-ACPR	PN offset
Lowest reference power	Max inactive I/Q power	Pilot, MAC, data power	Pilot, MAC, data power
Highest reference power	Avg inactive I/Q power	On/off ratio	Pilot, MAC, data Rho
Abs power at defined range	PN offset	PvsT mask (idle slot) or	(Composite) EVM
Rel power at defined range	***Code Domain Power (Data)***	PvsT mask (active slot)	Frequency error
Spurious emissions	Data channel power	Frequency error	Time offset
Peak frequency at defined range	Slot average power	Time offset	Carrier feed-through
Peak level at defined range	Max, avg active power	Carrier feed-through	Max active I/Q power
Power vs. Time	Max, avg inactive power	Pilot, MAC, data Rho	Avg active I/Q power
(Idle and Active Slot)	PN offset	Max inactive I/Q power	Code utilization
Slot average power		PN offset	Peak utilization
On/off ratio		***Power statistics CCDF***	Average utilization
Idle activity			
Pilot, MAC, data power			

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 +30 dBm	
Channel power (RRC) accuracy	±1.0 dB (typical)	
Modulations	QPSK, 8 PSK, 16 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
Channel power	Midamble power	***Code error***	***Sync-DL ID scanner (32)***
Channel power	(TS [0 to 6], DwPTS, UpPTS)	Slot, DwPTS power	Scramble code group
Spectral density	Data power right	No. of active code	Ec/Io, Tau
Peak to average power	(TS [0 to 6], DwPTS, UpPTS)	Scramble code	DwPTS power
Occupied bandwidth	Time offset	Max active code power	Pilot dominance
Occupied bandwidth	(TS [0 to 6], DwPTS, UpPTS)	Avg active code power	***Sync-DL ID vs. Tau (up to 6)***
Integrated power	***Power vs. time (mask)***	Max inactive code power	ID, power, Ec/Io, Tau
Occupied power	Slot power	Avg inactive code power	DwPTS power
Spectrum emission mask	On/off slot ratio	Peak CDE and peak active CDE	Pilot dominance
Reference power	***Timogram***	***Auto measure***	***Sync-DL ID multipath***
Peak level at defined range	***Constellation***	Channel power	Ec/Io, Tau
ACLR	Rho	Occupied bandwidth	DwPTS power
Reference power	EVM RMS, EVM peak	Spectrum emission mask	Pilot dominance
Abs power at defined range	Peak CDE	ACLR	***Sync-DL ID analyzer***
Rel power at defined range	Frequency error	Multi-ACLR	DwPTS power, Ec/Io trend
Multi-ACLR	IQ origin offset	Slot power	DwPTS power
Lowest reference power	Time offset	DwPTS power	Pilot dominance
Highest reference power	***Midamble power***	UpPTS power	EVM, frequency error
Abs power at defined range	Slot power	On/off slot ratio	Ec/Io, CINR
Rel power at defined range	DwPTS power	Frequency error	
Spurious emissions	Midamble power (1 to 16)	EVM RMS	
Peak frequency at defined range	***Code power***	Peak CDE	
Peak level at defined range	Slot power, DwPTS power	Max inactive power	
Power vs. time (slot)	No. of active code	Scramble code	
Slot power	Scramble code		
DwPTS power	Max active code power		
UpPTS power	Avg active code power		
On/off slot ratio	Max inactive code power		
Slot PAR	Avg inactive code power		
DwPTS code			
Power vs. time (frame)			
Slot power			
(TS [0 to 6], DwPTS, UpPTS)			
Data power left			
(TS [0 to 6], DwPTS, UpPTS)			

Longitude, latitude, and satellite in all screens

Mobile WiMAX Signal Analyzer (Option 026)

General Parameters		
Frequency range	2.1 GHz to 2.7 GHz 3.4 GHz to 3.85 GHz 5.2 GHz to 5.9 GHz	
Input signal level	–40 to +30 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
Channel power	***Constellation***	***Auto measure***	***Preamble scanner (up to 6)***
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
Occupied bandwidth	Frequency error	Spurious emission mask	Time offset
Occupied bandwidth	Time offset	Preamble power	***Multipath profile***
Integrated power	Segment ID, cell ID	DL burst power	Total preamble power
Occupied power	Preamble index	UL burst power	Multipath power
Spectrum emission mask	***Spectral flatness***	Frame average power	Relative power, delay
Reference power	Average subcarrier power	Time offset	***Preamble power trend***
Peak level at defined range	Subcarrier Pwr variation	IQ origin offset	Preamble power trend
Spurious emissions	Max, min, avg power	Spectral flatness	Relative power trend
Peak frequency at defined range	***EVM vs. subcarrier***	Frequency error	Preamble power
Peak level at defined range	RCE RMS, RCE peak	RCE RMS	Frame avg power
Power vs. time (frame)	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	***EVM vs. symbol***	***Power statistics CCDF***	Cell ID, sector ID
DL burst power	RCE RMS, RCE peak		Time offset
UL burst power	EVM RMS, EVM peak		
IQ origin offset	Segment ID, cell ID		
Time offset	Preamble index		

Longitude, latitude, and satellite in all screens

LTE-FDD Signal Analyzer (Option 028)

General Parameters		
Frequency range	Band 1 to Band 19	
Input signal level	–40 to +30 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	99% confidence level
Residual EVM (RMS)	2.0% (typical)	Data EVM

Measurements

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

Longitude, latitude, and satellite in all screens

LTE-TDD Signal Analyzer (Option 029)

General Parameters		
Frequency range	Band 33 to Band 40	
Input signal level	–40 to +30 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
Channel power	Frequency error	Antenna 0 RS power	***ID scanner (up to 6)***
Channel power	Time error	Antenna 0 RS EVM	RSRP/RSRQ dominance
Spectral density	***Data channel***	Antenna 1 RS power	S-SS RSSI dominance
Peak to average power	Resource block power	Antenna 1 RS EVM	S-SS Ec/Io dominance
Occupied bandwidth	IQ diagram	Cell, group, sector ID	Cell, group, sector ID
Occupied bandwidth	RB power	***Data allocation map***	RSRP/RSRQ
Integrated power	Modulation format	Data allocation vs frame	RS-SINR/S-SS RSSI
Occupied power	IQ origin offset	Resource block power	P-SS/S-SS power
Spectrum emission mask	EVM RMS, EVM peak	OFDM symbol power	S-SS Ec/Io
Reference power	***Control channel***	Data utilization	***Multipath profile***
Peak level at defined range	Control channel summary	Data allocation vs subframe	Cell, group, sector ID
ACLR	(P-SS, S-SS, PBCH, PCFICH, PHICH,	Resource block power	P-SS Ec/Io, delay
Reference power	PDCCH, RS)	Data utilization	S-SS Ec/Io, delay
Abs power at defined range	EVM, relative or absolute power,	***Auto measure***	***Control channel***
Rel power at defined range	modulation type	Channel power	RS power trend
Multi-ACLR	Each control channels'	Occupied bandwidth	Cell, group, sector ID
Lowest reference power	IQ diagram	Spectrum emission mask	Control channel table
Highest reference power	Modulation format	ACLR	(P-SS, S-SS, PBCH,
Abs power at defined range	Frequency error	Mult-ACLR	PCFICH, RS 0, RS 1)
Rel power at defined range	IQ origin offset	Slot average power	Absolute power
Spurious emissions	EVM RMS, EVM peak	Off power	Relative power
Peak frequency at defined range	***Subframe***	Transition period	EVM RSM, phase
Peak level at defined range	Subframe summary table	Time alignment error	Frequency error
Power vs. time (frame)	(P-SS, S-SS, PBCH, PCFICH, PHICH,	Frequency error	Time alignment error
Frame average power	PDCCH, RS, PDSCH, QPSK, 16, 64 QAM)	PDSCH QPSK EVM	Time offset
Subframe power	EVM, relative or absolute power,	PDSCH 16 QAM EVM	***Datagram***
First slot power	modulation type	PDSCH 64 QAM EVM	Datagram
Second slot power	Subframe power	Data EVM RMS, peak	Resource block power
Cell ID, IQ origin offset	OFDM symbol power	RS, P-SS, S-SS EVM	Data utilization
Time offset	Frequency, time error	RS, P-SS, S-SS power	
Power vs. time (slot)	Data EVM RMS, peak	PBCH power	
Slot average power	RS EVM RMS, peak	Subframe power	
Transient period length	Cell, group, sector ID	OFDM power	
Off power	***Time alignment error***	Time error	
Constellation	Time alignment error trend	IQ origin offset	
RS TX power	Time alignment error	***Power statistics CCDF***	
PDSCH QPSK EVM	RS power difference		
PDSCH 16 QAM EVM			
PDSCH 64 QAM EVM			
Data EVM RMS			
Data EVM peak			

Longitude, latitude, and satellite in all screens

E1 Analyzer (Option 002)

Electrical Interface	
Connectors RX/TX	RJ45C (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

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	***BERT***
Indicators	Indicators
E1 signal	E1 signal
Frame sync	Frame sync
Pattern sync	Pattern sync
Code sync	Code sync
FAS RAI	FAS RAI
AIS	AIS
HDB3	HDB3
Bit error[2]	Bit error[2]
Error count/rate	***Error count/rate***
Frame error	CRC error[1]
Code error	Frame error
Bit error[2]	Code error
	Bit error[2]
Alarm count	***Alarm count***
FAS	FAS
AIS	AIS
Loss count	***Loss count***
Frame sync	Frame sync
Pattern sync	Pattern sync

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

T1 Analyzer (Option 003)

Electrical Interface	
Connectors RX/TX	RJ45C (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

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	***RX signal level***
Indicators	Indicators
T1 signal	T1 signal
Frame sync	Frame sync
Pattern sync	Pattern sync
B8ZS	B8ZS
Red alarm	Red alarm
RAI (yellow alarm)	RAI (yellow alarm)
AIS (blue alarm)	AIS (blue alarm)
BPV indicator	BPV indicator
Loss count	Vp-p
Signal loss	Vp-p Max
Frame sync loss	Vp-p Min
Patten sync loss	dB_{dsx}
Alarm count	
RAI	
AIS	
BPV	
Error rate	
Bit error rate	
Bit error count	

General Information

Inputs and Outputs	
RF in	Spectrum analyzer
Connector	Type-N, female
Impedance	50 Ω (nominal)
Damage level	> +36 dBm, > ±50 VDC (nominal)
Reflection/RF out	Cable and antenna analyzer
Connector	Type-N, female
Impedance	50 Ω (nominal)
Damage level	> +25 dBm, > ±50 VDC (nominal)
RF in	Cable and antenna analyzer
Connector	Type-N, female
Impedance	50 Ω (nominal)
Maximum level	> +25 dBm, > ±50 VDC (nominal)
External trigger, GPS	
Connector	SMA, female
Impedance	50 Ω (nominal)
External ref	
Connector	SMA, female
Impedance	50 Ω (nominal)
Input frequency	10 MHz, 13 MHz, 15 MHz
Input range	–5 to +5 dBm
USB	
USB host[1]	Type A, 1 port
USB client[2]	Type B, 1 port
LAN	RJ45, 10/100Base-T
E1/T1	RJ45C
Audio jack	3.5 mm headphone jack
External power	5.5 mm barrel connector
Speaker	Built-in speaker

Display	
Size	8 inch, LED backlight
Resolution	800 x 600

Power		
External DC input	12 to 19 VDC	
Power consumption	33 W	60 W maximum (when charging battery)

Battery	
Type	10.8 V, 7800 mA/hr (Lithium ion)
Operating time	> 2.5 hours (typical)
Charge time	6 hours (80%), 8 hours (100%)
Storage temperature[3]	–10 to 60°C (14 to 140°F)

Data Storage	
Internal[4]	Minimum 1 GB
External[5]	Limited by size of USB flash drive

Environmental	
Operating temperature	–10 to 55°C (14 to 131°F)
Maximum humidity	85%
Shock and vibration	MIL-PRF-28800F Class 2
Storage temperature[6]	–55 to 71°C (–67 to 160°F)

EMC	
EN 61326-2-1	Complies with European EMC

Size and Weight (Standard configuration)	
Weight (with battery)	< 5.7 kg (12.6 lb)
Size (W x H x D)	315 x 245 x 95 mm (12.4 x 9.6 x 3.7 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 degrade battery performance and life
4. Up to 1000 instrument states and traces
5. Supports USB 2.0 compatible memory devices
6. With the battery pack removed

Ordering Information

JD7105B Base Station Analyzer	
100 kHz to 7.2 GHz	Spectrum Analyzer
25 MHz to 4 GHz	Cable and Antenna Analyzer[1]
10 MHz to 7.2 GHz	RF Power Meter (internal mode)

Options		
NOTE: Upgrade options for the JD7105B use the designation JD7105BU before the respective last two-digit option number.		
JD7105B002	E1 Analyzer[2]	
JD7105B003	T1 Analyzer[2]	
JD7105B010	GPS Receiver and Antenna	
JD7105B011	Interference Analyzer[3,4]	
JD7105B012	Channel Scanner	
JD7105B013	Bias-Tee	
JD7105B020	cdmaOne/cdma2000 Signal Analyzer	
JD7105B021	EV-DO Signal Analyzer	(Requires option 20)
JD7105B022	GSM/GPRS/EDGE Signal Analyzer	
JD7105B023	WCDMA Signal Analyzer	
JD7105B024	HSDPA Signal Analyzer	(Requires option 23)
JD7105B025	TD-SCDMA Signal Analyzer	
JD7105B026	Mobile WiMAX Signal Analyzer	
JD7105B028	LTE - FDD Signal Analyzer	
JD7105B029	LTE - TDD Signal Analyzer	
JD7105B040	cdmaOne/cdma2000 OTA Analyzer[4]	(Requires options 10 and 20)
JD7105B041	EV-DO OTA Analyzer[4]	(Requires options 10 and 21)
JD7105B042	GSM/GPRS/EDGE OTA Analyzer[4]	(Requires options 10 and 22)
JD7105B043	WCDMA/HSDPA OTA Analyzer[4]	(Requires options 10 and 23/24)
JD7105B045	TD-SCDMA OTA Analyzer[4]	(Requires options 10 and 25)
JD7105B046	Mobile WiMAX OTA Analyzer[4]	(Requires options 10 and 26)
JD7105B048	LTE - FDD OTA Analyzer[4]	(Requires options 10 and 28)
JD7105B049	LTE - TDD OTA Analyzer[4]	(Requires options 10 and 29)

Standard Accessories	
JD71050341	JD7100 Soft Carrying Case[5]
G710550326	AC/DC Power Adapter[5]
G710550335	Cross LAN Cable (1.5 m)[5]
GC73050515	USB A to B Cable (1.8 m)[5]
GC72450518	> 1 G Byte USB Memory[5]
G710550325	Rechargeable Lithium Ion Battery[5]
G710550323	Automotive Cigarette Lighter 12 VDC Adapter[5]
JD7100B361	JD7100B Series User's Manual and Application Software – CD

1. Requires Calibration Kit
2. Requires Test Cable
3. Highly recommends adding JD7105B010
4. Highly recommends adding G70005035x and/or G70005036x
5. Standard accessories can be purchased separately.

Optional 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
JD732A	Terminating Power Sensor (average power) Frequency: 20 MHz to 3.8 GHz Power: –30 to +20 dBm
JD734A	Terminating Power Sensor (peak power) Frequency: 20 MHz to 3.8 GHz Power: –30 to +20 dBm
JD736A	Terminating Power Sensor (peak and average power) Frequency: 20 MHz to 3.8 GHz Power: –30 to +20 dBm

Ordering Information (cont'd)

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
JD71050507	Dual Port Type-N Calibration Kit, 50 Ω • Y - Calibration Kit, Type-N(m), DC to 4 GHz, 50 Ω • Two Adapters Type-N(f) to Type-N(f), DC to 4 GHz, 50 Ω • Two 1 m RF Test Cables, Type-N(m) to Type-N(m), DC to 18 GHz, 50 Ω
JD71050508	Dual-Port DIN Calibration Kit, 50 Ω • Y-Calibration Kit DIN(m), DC to 4 GHz, 50 Ω • Two 1 m RF Test Cables, Type-N(m) to Type-N(m), DC to 18 GHz, 50 Ω • Adapter Type-N(f) to DIN(f), DC to 4 GHz, 50 Ω • Adapter Type-N(f) to DIN(m), DC to 4 GHz, 50 Ω • Adapter DIN(f) to DIN(f), DC to 4 GHz, 50 Ω • Adapter DIN(m) to DIN(m), DC to 4 GHz, 50 Ω

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

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

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

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 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)
JD71050342	Hard Carrying Case
JD71050343	JD7100 Backpack Carrying Case
G710550324	External Battery Charger
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)[6]
G710050586	RF Combiner, 700 MHz to 4 GHz, Type-N(f) to Type-N(m)[6]
JD7100B362	JD7100B Series User's Manual – Printed Version

6. Highly recommended items for LTE testing

Test & Measurement Regional Sales

NORTH AMERICA
TOLL FREE: 1 855 ASK-JDSU
1 855 275-5378

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

