CellAdvisor™

JD786A RF Analyzer

Spectrum Analyzer (Standard)

Frequency		
Frequency range	9 kHz to 8 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 8 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 kHz 1 MHz	 –100 dBc/Hz (–102 dBc/Hz, typical) –105 dBc/Hz (–112 dBc/Hz, typical) –115 dBc/Hz (–120 dBc/Hz, typical)	
Measurement Range		
	DANL to +25 dBm	
Input attenuator range	0 to 55 dB, 5 dB steps	
Maximum Input Level		
Average continuous power	+25 dBm	
DC voltage	±50 V DC	

*All specifications are subject to change without notice.

Spectrum Analyzer: 9 kHz to 8 GHz

Cable and Antenna Analyzer: 5 MHz to 6 GHz

Power Meter: 10 MHz to 8 GHz

Specification* Conditions

The JD786A 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 at 20 to 30°C after being at this temperature for 15 minutes
  - Nominal: a general, descriptive term or parameter

Displayed Average Noise Level (DANL)		
1 Hz RBW, 1 Hz VBW, 50 Ω termination, 0 dB attenuation, RMS detector		
Preamplifier Off		
10 MHz to 3 GHz	–140 dBm (–145 dBm, typical)	
>3 GHz to 5 GHz	–138 dBm (–142 dBm, typical)	
>5 GHz to 7 GHz	–135 dBm (–138 dBm, typical)	
>7 GHz to 8 GHz	–132 dBm (–135 dBm, typical)	
Preamplifier On		
10 MHz to 3 GHz	–160 dBm (–165 dBm, typical)	
>3 GHz to 5 GHz	–158 dBm (–162 dBm, typical)	
>5 GHz to 7 GHz	–155 dBm (–158 dBm, typical)	
>7 GHz to 8 GHz	–152 dBm (–155 dBm, typical)	
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		
1 MHz to 8 GHz	±1.3 dB (±0.5 dB typical)	20 to 30°C
	Add ±1.0 dB	–10 to 55°C after 60-minute warm up
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		
1 MHz to 8 GHz	1.5:1 (typical)	Atten >20 dB
Second Harmonic Distortion		
Mixer level	–25 dBm	
50 MHz to 2.6 GHz	<–65 dBc (typical)	
>2.6 GHz to 8 GHz	<–70 dBc (typical)	
Third-Order Inter-Modulation (Third-Order Intercept: TOI)		
200 MHz to 3 GHz	+10 dBm (typical)	
>3 GHz to 8 GHz	+12 dBm (typical)	

Spurious		
Inherent residual response		
Input terminated, 0 dB attenuation, preamplifier off, RBW at 10 kHz, Sweep mode	–90 dBm (nominal)	
Exceptions	–85 dBm at 164.1 MHz, 2.57264, 3.2, and 4.5 GHz –80 dBm at 4.8/7.8 GHz –75 dBm at 85.6 MHz and 428 MHz –70 dBm at 256.8 MHz	
Input-related spurious	<–70 dBc (nominal)	
Dynamic Range		
2/3 (TOI-DANL) in 1 Hz RBW	>104 dB	at 2 GHz
Sweep Time		
Range	0.4 ms to 1000 s 24 µs to 200 s	Span = 0 Hz (zero span)
Accuracy	±2%	Span = 0 Hz (zero span)
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 detection		
Dual spectrum		

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

Cable and Antenna Analyzer (Standard)

Frequency	
Range	5 MHz to 6 GHz
Resolution	10 kHz
Accuracy	±1 ppm
Data Points	
126, 251, 501, 1001, 2001	
Measurement Speed	
Reflection/DTF	1.0 ms/point (typical)
Measurement Accuracy	
Corrected directivity	40 dB
Reflection uncertainty	±(0.3 + |20log (1+10-EP/20)|) (typical) EP = directivity – measured return loss
Output Power	
High	5 MHz to 5.5 GHz, 0 dBm (typical) 5.5 GHz to 6 GHz, –5 dBm (typical)
Low	5 MHz to 6 GHz, –30 dBm (typical)
Dynamic Range	
Reflection	60 dB
Maximum Input Level	
Average continuous power	+25 dBm (nominal)
DC voltage	±50 V DC
Interference Immunity	
On channel	+17 dBm at >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	$(1.5 \times 10^8) \times (V_p)/\text{delta}$ V_p = propagation velocity Delta = stop freq – start freq (Hz)
Cable Loss (1-Port)	
Range	0 to 30 dB
Resolution	0.01 dB
1-Port Phase	
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 0.1 x W (x = m, u, p)		
Internal RF Power Sensor			
Frequency range	10 MHz to 8 GHz		
Span	1 kHz to 100 MHz		
Dynamic range	–120 to +25 dBm		
Maximum power	+25 dBm		
Accuracy	Same as spectrum analyzer		
External RF Power Sensors			
Directional	***JD731B***	***JD733A***	
Frequency range	300 MHz to 3.8 GHz	150 MHz to 3.5 GHz	
Dynamic range	0.15 to 150 W (average) 4 to 400 W (peak)	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	***JD732B***	***JD734B***	***JD736B***
Frequency range	20 MHz to 3.8 GHz		
Dynamic range	–30 to +20 dBm		
Connector type	Type-N male		
Measurement type	Average	Peak	Average and peak
Accuracy	±7%[1]		

Optical Power Meter (Standard)

Optical Power Meter		
Display range	–100 to +100 dBm	
Offset range	0 to 60 dB	
Resolution	0.01 dB or 0.1 mW	
External Optical Power Sensors		
	MP-60A	***MP-80A***
Wavelength range	780 to 1650 nm	
Max permitted input level	+10 dBm	+23 dBm
Connector type	Type-N female on both ends	
Connector input	Universal 2.5 and 1.25 mm	
Accuracy	±5%	

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

2-Port Transmission Measurements (Option 001)

Frequency		
Frequency range	5 MHz to 6 GHz	
Frequency resolution	10 kHz	
Output Power		
High	5 MHz to 5.5 GHz, 0 dBm (typical) 5.5 GHz to 6 GHz, –5 dBm (typical)	
Low	5 MHz to 6 GHz, –30 dBm (typical)	
Measurement Speed		
Vector	1.6 ms/point (typical)	
Scalar	3.4 ms/point (typical)	
Dynamic Range		
Vector	5 MHz to 3 GHz, 80 dB >3 GHz to 6 GHz, 75 dB	at average 5 at average 5
Scalar	5 MHz to 4.5 GHz, >110 dB 4.5 GHz to 6 GHz, >105 dB	
Measurements		
Insertion Loss/Gain Range Resolution	 –120 to 100 dB 0.01 dB	
2-Port Phase Range Resolution	 –180 to +180° 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	5 MHz to 6 GHz
Frequency reference	<±1 ppm maximum
Frequency resolution	10 kHz
Output Power	
Range	5 MHz to 5.5 GHz, –60 to 0 dBm >5.5 to 6 GHz, –60 to –5 dBm
Step	1 dB
Accuracy	±1.5 dB (20 to 30°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	

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	
	1 MHz to 8 GHz
Measurement Range	
	110 to +25 dBm
Measurements	
Channel scanner	1 to 20 channels
Frequency scanner	1 to 20 frequencies
Custom scanner	1 to 20 channels or frequencies

Bluetooth Connectivity (Option 006)

Personal Area Network (PAN)
File Transfer Profile (FTP)

General Information

Inputs and Outputs		
RF In Connector Impedance Damage level	Spectrum analyzer Type-N, female 50 Ω (nominal) >+33 dBm, ±50 V DC (nominal), 3 min	
Reflection/RF Out Connector Impedance Damage level	Cable and antenna analyzer Type-N, female 50 Ω (nominal) >+40 dBm, ±50 V DC (nominal), 3 min	
RF In Connector Impedance Damage level	Cable and antenna analyzer Type-N, female 50 Ω (nominal) >+25 dBm, ±50 V DC (nominal)	
External Trigger, GPS Connector Impedance	 SMA, female 50 Ω (nominal)	
External Ref Connector Impedance Input frequency Input range	 SMA, female 50 Ω (nominal) 10 MHz, 13 MHz, 15 MHz –5 to +5 dBm	
USB USB host[1] USB client[2]	 Type A, 1 port Type B, 1 port	
LAN	RJ45, 10/100Base-T	
E1/T1	RJ45	
Audio jack	3.5 mm headphone jack	
External power	5.5 mm barrel connector	
Speaker	Built-in speaker	
Display		
Type	Resistive touch screen	
Size	8 inch, LED backlight, transflective LCD with anti-glare coating	
Resolution	800 x 600	
Power		
External DC input	12 to 19 V DC	
Power consumption	37 W	49 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%), 5 hours (100%)
Charging temperature	0 to 45°C (32 to 104°F) ≤85% RH
Discharging temperature	–20 to 55°C (4 to 131°F) ≤85% RH
Storage temperature[3]	0 to 25°C (32 to 77°F) ≤85% RH (noncondensing)
Data Storage	
Internal[4]	Maximum 100 MB
External[5]	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) at charging –10 to 55°C (14 to 131°F) at discharging
Maximum humidity	95% RH (noncondensing)
Shock and vibration	MIL-PRF-28800F class 2
Storage temperature[6]	–30 to 71°C (–22 to 160°F)
EMC	
IEC/EN 61326-1:2006 (complies with European EMC)	
CISPR11:2009 +A1:2010	
ESD	
IIEC/EN 61000-4-2	
Size and Weight (standard configuration)	
Weight (with battery)	<4.3 kg (9.5 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 3800 traces
5. Supports USB 2.0 compatible memory devices
6. With the battery pack removed

Ordering Information

Description	Part Number
Standard CellAdvisor JD786A RF Analyzer	
9 kHz to 8 GHz spectrum analyzer 5 MHz to 6 GHz cable and antenna analyzer[1] 10 MHz to 8 GHz RF power meter (internal mode)	JD786A
Options NOTE: Upgrade options for the JD786A use the designation JD786AU before the respective last three-digit option number.	
2-port transmission measurement[2]	JD786A001
Bias-tee[3]	JD786A002
CW signal generator	JD786A003
Bluetooth connectivity[4]	JD786A006
GPS receiver and antenna	JD786A010
Interference analyzer[5,6]	JD786A011
Channel scanner	JD786A012
Standard Accessories	
AC/DC power adapter[7]	G710550326
Cross LAN cable (1.5 m)[7]	G710550335
USB A to B cable (1.8 m)[7]	GC73050515
>1 GB USB memory[7]	GC72450518
Rechargeable lithium ion battery[7]	G710550325
Automotive cigarette lighter 12 V DC adapter[7]	G710550323
Stylus[7]	G710550316
JD780A series user's manual and application software — CD	JD780A361
Optional Calibration Kits	
Y-calibration kit, Type-N(m), DC to 6 GHz, 50 Ω	JD78050509
Dual-port Type-N calibration kit, 50 Ω Y-calibration kit, Type-N(m), DC to 6 GHz, 50 Ω Two adapters Type-N(f) to Type-N(f), DC to 18 GHz, 50 Ω Two 1 m RF test cables, Type-N(m) to Type-N(m), DC to 8 GHz, 50 Ω	JD78050507
Optional RF Cables	
1.5 m (4.92 ft) RF cable, DC to 18 GHz, Type-N(m) to SMA(m), 50 Ω	G710050533
1.5 m (4.92 ft) RF cable, DC to 18 GHz, Type-N(m) to QMA(m), 50 Ω	G710050534
1.5 m (4.92 ft) RF cable, DC to 18 GHz, Type-N(m) to SMB(m), 50 Ω	G710050535
RF cable DC to 6 GHz Type-N(m) to DIN(f), 1.5 m	G710050536
RF cable DC to 8 GHz Type-N(m) to Type-N(m), 1.0 m	G700050530
RF cable DC to 8 GHz Type-N(m) to Type-N(f), 1.5 m	G700050531
RF cable DC to 8 GHz Type-N(m) to Type-N(f), 3.0 m	G700050532
Phase-stable RF cable with grip DC to 6 GHz Type-N(m) to Type-N(f), 1.5 m	G700050540
Phase-stable RF cable with grip DC to 6 GHz Type-N(m) to DIN(f), 1.5 m	G700050541

Description	Part Number
Optional Omni Antennas	
RF omni antenna Type-N(m), 806 MHz to 896 MHz	G700050353
RF omni antenna Type-N(m), 870 MHz to 960 MHz	G700050354
RF omni antenna Type-N(m), 1.71 GHz to 2.17 GHz	G700050355
RF omni antenna Type-N(m), 720 MHz to 800 MHz	G700050356
RF omni antenna Type-N(m), 2.3 GHz to 2.7 GHz	G700050357
Optional Yagi Antennas	
RF Yagi antenna Type-N(f), 806 MHz to 896 MHz, 10.2 dBd[8]	G700050364
RF Yagi antenna Type-N(f), 866 MHz to 960 MHz, 10.2 dBd[8]	G700050365
RF Yagi antenna Type-N(f), 1.75 GHz to 2.39 GHz, 9.8 dBd[8]	G700050363
RF Yagi antenna Type-SMA(f), 700 MHz to 4 GHz, 1.85 dBd[9]	G700050366
Optional RF Power Sensors	
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	JD731B
Directional power sensor (peak and average power) Frequency: 150 MHz to 3.5 GHz Power: average/peak 0.1 to 50 W	JD733A
Terminating power sensor (average power) Frequency: 20 MHz to 3.8 GHz Power: –30 to +20 dBm	JD732B
Terminating power sensor (peak power) Frequency: 20 MHz to 3.8 GHz Power: –30 to +20 dBm	JD734B
Terminating power sensor (peak and average power) Frequency: 20 MHz to 3.8 GHz Power: –30 to +20 dBm	JD736B
Optional Optical Power Meters and Fiber Microscope Kits	
USB optical power meter with software, 2.5 and 1.25 mm interfaces, 30-inch USB extender, and carrying pouch	MP-60A
USB optical power meter—high power with software, 2.5 and 1.25 mm interfaces, 30-inch USB extender, and carrying pouch	MP-80A
KIT: FBP-P5000i Digital Probe, FiberChekPRO software, case, and tips	FBP-SD101
KIT: FBP-P5000i Digital Probe, FiberChekPRO software, case, and tips	FBP-MTS-101
KIT: FBP-P5000i Digital Probe, MP-60A USB power meter, FiberChekPRO software, case, tips, and adapters	FIT-SD103
KIT: FBP-P5000i Digital Probe, MP-60A USB power meter, FiberChekPRO software, case, tips, and adapters, and cleaning materials	FIT-SD103-C
KIT: FBP-P5000i Digital Probe, MP-60A USB power meter, FiberChekPRO software, case, tips, and adapters	FIT-SD113

Ordering Information continued

Description	Part Number
Optional RF Adapters	
Adapter Type-N(m) to DIN(f), DC to 7.5 GHz, 50 Ω	G700050571
Adapter DIN(m) to DIN(m), DC to 7.5 GHz, 50 Ω	G700050572
Adapter Type-N(m) to SMA(f) DC to 18 GHz, 50 Ω	G700050573
Adapter Type-N(m) to BNC(f), DC to 4 GHz, 50 Ω	G700050574
Adapter Type-N(f) to Type-N(f), DC to 18 GHz 50 Ω	G700050575
Adapter Type-N(m) to DIN(m), DC to7.5 GHz, 50 Ω	G700050576
Adapter Type-N(f) to DIN(f), DC to 7.5 GHz, 50 Ω	G700050577
Adapter Type-N(f) to DIN(m), DC to 7.5 GHz, 50 Ω	G700050578
Adapter DIN(f) to DIN(f), DC to 7.5 GHz, 50 Ω	G700050579
Adapter Type-N(m) to Type-N(m), DC to 11 GHz 50 Ω	G700050580
Adapter N(m) to QMA(f), DC to 6.0 GHz, 50 Ω	G700050581
Adapter N(m) to QMA(m), DC to 6.0 GHz, 50 Ω	G700050582
Optional Miscellaneous	
Attenuator 40 dB, 100 W, DC to 4 GHz (unidirectional)	G710050581
Soft carrying case	JD74050341
Hard carrying case	JD71050342
Hard carrying case with wheels	JD70050342
CellAdvisor backpack carrying case	JD70050343
RF directional coupler, 700 MHz to 4 GHz, 30 dB, input/output; Type-N(m) to Type-N(f), tap off; Type-N(f)[10]	G710050585
RF combiner, 700 MHz to 4 GHz, Type-N(f) to Type-N(m)[10]	G710050586
External battery charger	G710550324
JD780A series user's manual – printed version	JD780A362

Description	Part Number
StrataSync™	
StrataSync Asset Management Annual Subscription for CA RFA	StrataSync-AM-CA-RFA-1Yr
StrataSync Test Data Management Annual Subscription for CA RFA	StrataSync-TDM-CA-RFA-1Yr[11]
Warranty and Calibration	
Warranty extension of 1 year for Asia and North America	JD786A200
Warranty extension of 1 year for Latin America and EMEA	JD786A201
Calibration service for Asia and North America	JD786A250
Calibration service for Latin America and EMEA	JD786A251

1. Requires calibration kit
2. Requires dual-port calibration kit
3. Requires Option 001
4. Includes a pair of Bluetooth USB dongles with 5 dBi dipole antenna (JD70050006)
5. Highly recommend adding GPS receiver JD786A010
6. Highly recommend adding antennas G70005035x and/or G70005036x
7. Standard accessory that can be purchased separately
8. Require RF cables G710050530
9. Requires RF cables G710050533
10. Highly recommended for LTE testing
11. Requires STRATASYNC-AM-CA-RFA-1Yr

JDSU

North America	Toll Free: 1 855 ASK-JDSU	(1 855 275-5378)
Latin America	Tel: +1 954 688 5660	Fax: +1 954 345 4668
Asia Pacific	Tel: +852 2892 0990	Fax: +852 2892 0770
EMEA	Tel: +49 7121 86 2222	Fax: +49 7121 86 1222

www.jdsu.com/nse

30173455 005 0614 JD786ARFA.DS.CPO.TM.AE June 2014