VIAVI Solutions

Data Sheet

VIAVI
CellAdvisor™
JD785B Base Station Analyzer

Spectrum Analyzer (Standard)

Frequency		
Frequency range	9 kHz to 8 GHz	
Frequency accuracy	± (Readout frequency x Internal 10MHz Frequency reference accuracy + RBW centering + 2 Hz + 0.5 x Horizontal resolution)	
Internal 10 MHz Frequency Reference		
Accuracy	±0.05 ppm + aging (0 to 50°C) ±0.01 ppm, after 15 minutes of GPS Lock (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	

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

JD785B 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 2.4 GHz	–140 dBm (–145 dBm, typical)
>2.4 GHz to 6 GHz	–136 dBm (–140 dBm, typical)
>6 GHz to 7 GHz	–134 dBm (–138 dBm, typical)
>7 GHz to 8 GHz	–128 dBm (–134 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	–150 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 after 60-minute warm up
	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 and 770.4 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

* High-power 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 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	

High Power CW Signal Generator (Option 003)

Frequency	
Frequency range	10 MHz to 5500 MHz
Frequency reference	<±1 ppm maximum
Frequency resolution	10 kHz
Output Power	
Range	10 MHz to 3.5 GHz, –60 to +10 dBm 3.5 GHz to 5.5 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	±10 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 013)

Personal area network (PAN)
File transfer profile (FTP)

Wi-Fi Connectivity (Option 016)

Interface type	USB LAN Card
Interface standard	IEEE 802.11 b/g/n
Chipset	RealTek, Ralink
USB wireless mode	Infrastructure mode
Web-based remote control	Internet Explorer, Chrome, Safari
Internet protocol version	IPv4, IPv6

GSM/GPRS/EDGE Signal Analyzer (Options 022 and 042)

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 +25 dBm	
Burst power	±1.0 dB	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
GMSK modulation quality		
Phase RMS Accuracy Residual error Phase peak accuracy 8 PSK modulation quality	 ±1.0 degrees 0.7 degrees (typical) ±2.0 degrees	 (0 < Phase RMS < 8) (0 < Phase peak < 30)
EVM Accuracy Residual error RF power vs. time	±1.5% 2.5% ±0.25 symbol	(2% < EVM < 8%)

Measurements

Option 022

Channel Power	***Spectrum Emission Mask***	***Power vs. Time (slot)***	Frequency error	***Auto Measure***	Phase error RMS
Channel power	Reference power	Burst power	Phase error RMS	Channel power	Phase error peak
Spectral density	Peak level at defined range	Max/min point	Phase error peak	Occupied bandwidth	EVM RMS*
Peak to average power		***Power vs. Time (frame)***	I/Q origin offset*	Spectrum emission mask	EVM Peak*
Occupied Bandwidth	***Spurious Emissions***	Frame average power	TSC	Spurious emission mask	I/Q origin offset
Occupied bandwidth	Peak frequency at defined range	Burst power (Slot 0 to 7)	BSIC	Burst power	C/I*
Integrated power		TSC (Slot 0 to 7)	C/I*	PvsT – mask	
Occupied power	Peak level at defined range	***Constellation***	EVM RMS*	Frame average power	
		Burst power	EVM Peak*	Frequency error	
		Modulation type	EVM 95th*		

Option 042

Channel/Frequency Scanner	Group (traffic, control)	***Multipath Profile***	***Modulation Analyzer***	Frame average power	Burst power
	BSIC (NCC, BCC)	(10 strongest)	Frame avg power trend	BSIC, frame no. and time	Modulation type
Channels or frequencies		Frame average power	C/I trend	C/I, frequency error	
Absolute power		SNR, delay			

Longitude, latitude, and satellite in all screens

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

WCDMA/HSPA+ Signal Analyzer (Options 023 and 043)

General Parameters		
Frequency range	Band 1 to 14, 19 to 22, 25, 26	
Input signal range	–40 to +25 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

Option 023

Channel Power	***ACLR***	***Constellation***	Max, avg active power	***Codogram***	***Auto Measure***
Channel power	Reference power	CPICH power	Max, avg inactive power	Code utilization	Channel power
Spectral density	Abs power at defined range	Rho, EVM	Scramble code	***RCSI***	Occupied bandwidth
Peak to average power		Peak CDE	***Relative Code Domain Error***	CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH	Spectrum emission mask
Occupied Bandwidth	Rel power at defined range	Frequency error			ACLR
Occupied bandwidth		Time offset	Abs/Rel code power	***CDP Table***	Multi-ACLR
Integrated power	***Multi-ACLR***	Carrier feed-through	Code error	Reference power	Spurious emission mask
Occupied power	Lowest reference power	Scramble code	Individual code EVM, RCDE, and its constellation	Code utilization	Frequency error
Spectrum Emission Mask	Highest reference power	***Code Domain Power***		Code, spreading factor	EVM
Reference power	Abs power at defined range	Abs/Rel code power		Allocation (channel type)	Peak CDE
Peak level at defined range		Individual code EVM and its constellation	Channel power	EVM, modulation type	Carrier feed-through
	Rel power at defined range		Power bar graph (Abs/Rel/Delta power) CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH	Relative, absolute power	CPICH absolute power
		Channel power			CPICH relative power
	Spurious Emissions	Power bar graph (Abs/Rel/Delta power) CPICH, P-CCPCH, S-CCPCH PICH, P-SCH, S-SCH			Max inactive power
	Peak frequency at defined range				Scramble code
			Avg RCDE QPSK, 16 QAM, 64 QAM		***Power Statistics CCDF***
	Peak level at defined range				

Option 043

Channel Scanner (up to 6)	***Scramble Scanner (up to 6)***	***Multipath Profile***	***Code Domain Power***	Max, avg active power	Amplifier capacity
		Channel, multipath power	Abs/Rel code power	Max, avg inactive power	Peak amplifier capacity
Frequencies or channels	Channel power	Ec/Io, delay	Individual code EVM	Frequency error	Average amplifier capacity
Channel power, scramble code, CPICH power, Ec/Io	CPICH dominance		Channel power	Time offset, Rho	
	Scramble code		Scramble code	Carrier feed-through	Code, peak utilization
	Ec/Io, CPICH power, delay		CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH	(Composite) EVM	Average utilization
				CPICH EVM, P-CCPCH EVM	***Route Map***
					CPICH power, Ec/Io

Longitude, latitude, and satellite in all screens

cdmaOne/cdma2000® Signal Analyzer (Options 020 and 040)

General Parameters		
Frequency range	Band 0 to 10	
Input signal level	–40 to +25 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	***ACPR***	***Spurious Emissions***	***Code Domain Power***	***RCSI***	***Auto Measure***
Channel power	Reference power	Peak freq at defined range	Abs/Rel code power	Pilot, Paging, Sync, Q-Paging	Channel power
Spectral density	Abs power at defined range	Peak level at defined range	Channel power		Occupied bandwidth
Peak to average power		***Constellation***	Power bar graph (Abs/Rel)	***CDP Table***	Spectrum emission mask
Occupied Bandwidth	Rel power at defined range	Pilot power	Pilot, Paging, Sync, Q-Paging	Reference power	ACPR
Occupied bandwidth		Rho		Code utilization	Multi-ACPR
Integrated power	***Multi-ACPR***	EVM	Max, avg active power	Code, spreading factor	Rho
Occupied power	Lowest reference power	Frequency error	Max, avg inactive power	Allocation (channel type)	Frequency error
Spectrum Emission Mask	Highest reference power	Time offset	PN offset	Relative, absolute power	Time offset
Reference power	Abs power at defined range	Carrier feed-through	***Codogram***		Carrier feed-through
Peak level at defined range		PN offset	Code utilization		Pilot power
	Rel power at defined range				Max inactive power
					PN offset
					Power Statistics CCDF

Option 040

Channel Scanner (up to 6)	***PN Scanner (up to 6)***	***Multipath Profile***	***Code Domain Power***	Frequency error	Code utilization
	Channel power	Channel power	Abs/Rel code power	Time offset, Rho, EVM	Peak utilization
Frequencies or channels	Pilot dominance	Multipath power	Channel power	Carrier feed-through	Average utilization
Channel power, PN offset	PN offset	Ec/Io, delay	PN offset	Amplifier capacity	***Route Map***
Pilot power, Ec/Io	Ec/Io, pilot power, delay		Pilot, Paging, Sync, Q-Paging power	Peak amplifier capacity	Pilot power
				Average amplifier capacity	Ec/Io
			Max, avg active power		
			Max, avg inactive power		

Longitude, latitude, and satellite in all screens

EV-DO Signal Analyzer (Options 021 and 041)

General Parameters		
Frequency range	Band 0 to 10	
Input signal level	–40 to +25 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

Channel Power	***ACPR***	***Power vs. Time (idle and active slot)***	***Constellation (pilot, MAC 64/128, and data)***	***Code Domain Power (data)***	***Auto Measure***
Channel power	Reference power				Channel power
Spectral density	Abs power at defined range	Slot average power	Channel power	Data channel power	Occupied bandwidth
Peak to average power		On/off ratio	Rho, EVM, peak CDE	Slot average power	Spectrum emission mask
Occupied Bandwidth	Rel power at defined range	Idle activity	Frequency error	Max, avg active power	ACPR
Occupied bandwidth		Pilot, MAC, data power	Time offset	Max, avg inactive power	Multi-ACPR
Integrated power	***Multi-ACPR***	***Constellation (composite 64/128)***	Carrier feed-through	PN offset	Pilot, MAC, data power
Occupied power	Lowest reference power		PN offset	***MAC Codogram***	On/off ratio
Spectrum Emission Mask	Highest reference power	Channel power	Modulation type*	Code utilization	PvsT mask (idle slot) or PvsT mask (active slot)
	Abs power at defined range	Rho, EVM, Peak CDE	***Code Domain Power (pilot and MAC 64/128)***	***RCSI***	
Reference power		Frequency error		Slot, pilot, MAC, data	Frequency error
Peak level at defined range	Rel power at defined range	Time offset	Pilot/MAC channel power	***MAC CDP Table***	Time offset
		Carrier feed-through	Slot average power	Reference power	Carrier feed-through
	Spurious Emissions	PN offset	Max active I/Q power	Code utilization	Pilot, MAC, data Rho
	Peak frequency at defined range	Pilot, MAC, data power	Avg active I/Q power	Code, spreading factor	Max inactive I/Q power
		Pilot, MAC, data EVM	Max inactive I/Q power	Allocation (channel type)	PN offset
	Peak level at defined range		Avg inactive I/Q power	Relative, absolute power	***Power Statistics CCDF***
			PN offset		

Option 041

Channel Scanner (up to 6)	***PN Scanner (up to 6)***	***Multipath Profile***	***Code Domain Power***	Frequency error	Peak utilization
	Channel power	Channel power	Slot average power	Time offset	Average utilization
Frequencies or channels	Pilot dominance	Multipath power	PN offset	Carrier feed-through	***Route Map***
PN offset	PN offset	Ec/Io, delay	Pilot, MAC, data power	Max active I/Q power	Pilot power
Pilot, MAC, data power	Ec/Io, pilot power, delay		Pilot, MAC, data Rho	Avg active I/Q power	Ec/Io
			(Composite) EVM	Code utilization	

Longitude, latitude, and satellite in all screens

*Measurement is performed in Data Constellation only.

TD-SCDMA Signal Analyzer (Options 025 and 045)

General Parameters		
Frequency range	1.785 GHz to 2.22 GHz	
Input signal level	−40 to +25 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
Code domain power	±0.5 dB relative power ±1.5 dB absolute power	Code channel power >−25 dB Code channel power >−25 dB
Time error (Tau)	±0.2 µs (typical)	External trigger
Spreading factor	Auto (DL, UL), 1, 2, 4, 8, 16	

Measurements

Option 025

Channel Power	***Multi-ACLR***	***Power vs. Time (frame)***	***Midamble Power***	***Code Error***	***Auto Measure***
Channel power	Lowest reference power	Slot power	Slot power	Code power and error	Channel power
Spectral density	Highest reference power	(TS [0 to 6], DwPTS, UpPTS)	DwPTS power	Individual code EVM and its constellation	Occupied bandwidth
Peak to average power	Abs power at defined range	Data power left	Midamble power (1 to 16)		Spectrum emission mask
Occupied Bandwidth		(TS [0 to 6], DwPTS, UpPTS)	***Code Power***	Data format	ACLR
Occupied bandwidth	Rel power at defined range	***Midamble Power***	Abs/Rel code power	Slot, DwPTS power	Multi-ACLR
Integrated power		(TS [0 to 6], DwPTS, UpPTS)	Individual code EVM and its constellation	No. of active code	Slot power
Occupied power	Spurious Emissions	Data power right		Scramble code	DwPTS power
Spectrum Emission Mask	Peak frequency at defined range	(TS [0 to 6], DwPTS, UpPTS)	Data format	Max active code power	UpPTS power
Reference power		Time offset	Slot power, DwPTS power	Avg active code power	On/off slot ratio
Peak level at defined range	Peak level at defined range	(TS [0 to 6], DwPTS, UpPTS)	No. of active code	Max inactive code power	Frequency error
ACLR		***Power vs. Time (mask)***	Scramble code	Avg inactive code power	EVM RMS
Reference power	***Power vs. Time (slot)***	Slot power	Max active code power	Peak CDE and peak active CDE	Peak CDE
Abs power at defined range	Slot power	On/off slot ratio	Avg active code power		Max inactive power
	DwPTS power	Off power	Max inactive code power		Scramble code
Rel power at defined range	UpPTS power	***Timogram***	Avg inactive code power		
	On/off slot ratio	***Constellation***			
	Slot PAR	Rho			
	DwPTS code	EVM RMS, EVM peak			
		Peak CDE			
		Frequency error			
		I/Q origin offset			
		Time offset			

Option 045

Sync-DL ID Scanner (32)	***Sync-DL ID vs. Tau (up to 6)***	***Sync-DL ID Multipath***	***Sync-DL ID Analyzer***	Pilot dominance	***Route Map***
Scramble code group		Ec/Io, Tau	DwPTS power, Ec/Io trend	EVM, frequency error	DwPTS Power
Ec/Io, Tau	ID, power, Ec/Io, Tau	DwPTS power	DwPTS power	Ec/Io, CINR	
DwPTS power	DwPTS power	Pilot dominance			
Pilot dominance	Pilot dominance				

Longitude, latitude, and satellite in all screensTD-SCDMA Signal Analyzer (Option 025)

Mobile WiMAX Signal Analyzer (Options 026 and 046)

General Parameters		
Frequency range	2.1 GHz to 2.7 GHz 3.4 GHz to 3.85 GHz	
Input signal level	−40 to +25 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

Channel Power	***Spurious Emissions***	***Constellation***	***EVM vs. Subcarrier***	***Auto Measure***	Time offset
Channel power	Peak frequency at defined range	Channel power	RCE RMS, RCE peak	Channel power	I/Q origin offset
Spectral density		RCE RMS, RCE peak	EVM RMS, EVM peak	Occupied bandwidth	Spectral flatness
Peak to average power	Peak level at defined range	EVM RMS, EVM peak	Segment ID, cell ID	Spectrum emission mask	Frequency error
Occupied Bandwidth	***Power vs. Time (frame)***	Frequency error	Preamble index	Spurious emission mask	RCE RMS
Occupied bandwidth	Channel power	Time offset	***EVM vs. Symbol***	Preamble power	RCE peak
Integrated power	Frame average power	Segment ID, cell ID	RCE RMS, RCE peak	DL burst power	EVM RMS
Occupied power	Preamble power	Preamble index	EVM RMS, EVM peak	UL burst power	EVM peak
Spectrum Emission Mask	DL burst power	***Spectral Flatness***	Segment ID, cell ID	Frame average power	***Power Statistics CCDF***
Reference power	UL burst power	Average subcarrier power	Preamble index		
Peak level at defined range	I/Q origin offset	Subcarrier power variation			
	Time offset				
		Max, min, avg power			

Option 046

Preamble Scanner	***Multipath Profile***	***Preamble Power Trend***		***Route Map***
Total preamble power	Total preamble power	Preamble power trend	C/I	Preamble power
Preamble, relative power	Multipath power	Relative power trend	Preamble	
Cell ID, sector ID	Relative power, delay	Preamble power	Cell ID, sector ID	
Time offset		Frame avg power	Time offset	
		Relative power		

Longitude, latitude, and satellite in all screens

LTE/LTE-Advanced—FDD Signal Analyzer (Options 028/030/032 and 048)

General Parameters		
Frequency range	Band 1 to 14, 17 to 26	
Input signal level	–40 to +25 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 028/030/032

Channel Power	***Power vs. Time (frame)***	***Control Channel***	Data EVM RMS, peak	Antenna 1 RS power and EVM	PDSCH/Data* 64 QAM EVM
Channel power	Frame average power	Control channel summary (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*)	RS EVM RMS, peak		
Spectral density	Subframe power		Cell, group, sector ID	Antenna 2 RS power and EVM**	PDSCH 256QAM EVM
Peak to average power	First slot power		***Frame***		Data EVM RMS, peak
Occupied Bandwidth	Second slot power		MBSFN*	Antenna 3 RS power and EVM**	RS, P-SS, S-SS EVM
Occupied bandwidth	Cell ID, I/Q origin offset		Frame summary table (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/ Data* QPSK, PDSCDH/ Data* 16 QAM, PDSCH/ Data* 64 QAM, PDSCH 256QAM)		RS, P-SS, S-SS power
Integrated power	Time offset	EVM, relative or absolute power, modulation type		***Data Allocation Map***	PBCH power
Occupied power	***Constellation***			Data allocation vs frame	Subframe power
Spectrum Emission mask	MBSFN*	Each control channels'		Resource block power	OFDM power
	RS TX power	I/Q diagram		OFDM symbol power	Time error
Reference power	PDSCH/Data* QPSK EVM	Modulation format		Data utilization	I/Q origin offset
Peak level at defined range	PDSCH/Data* 16 QAM EVM	Frequency error	EVM, relative or absolute power, modulation type	Data allocation vs subframe	***Carrier Aggregation****
ACLR	PDSCH/Data* 64 QAM EVM	I/Q origin offset		Resource block power	Component carriers: up to 5
Reference power	PDSCH 256QAM EVM	EVM RMS, EVM peak	Frame average power	Data utilization	Subframe power
Abs power at defined range	Data EVM RMS		OFDM symbol power	***Auto Measure***	P-SS, S-SS, PBCH, RS power and EVM
	Data EVM peak	***Subframe***	Frequency error	Channel power	
Rel power at defined range	Frequency error	MBSFN*	I/Q origin offset	Occupied bandwidth	PDSCH/Data* QPSK power and EVM
Multi-ACLR	Time error	Subframe summary table (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/ Data* QPSK, PDSCH/ Data* 16 QAM, PDSCH/ Data* 64 QAM, PDSCH 256QAM)	EVM RMS, peak	Spectrum emission mask	PDSCH/Data* 16 QAM power and EVM
Lowest reference power	***Data Channel***		Data EVM RMS, peak	ACLR	
Highest reference power	MBSFN*		Cell, group, sector ID	Multi-ACLR	PDSCH/Data* 64 QAM power and EVM
Abs power at defined range	Resource block power		***Time Alignment Error***	Spurious emission mask	
Rel power at defined range	I/Q diagram		Time alignment error trend	Frame average power	PDSCH 256QAM EVM
Spurious Emissions	RB power		Time alignment error	Time alignment error	Cell ID
Peak frequency at defined range	Modulation format	EVM, relative or absolute power, modulation type	RS power difference	Frequency error	Frequency error
Peak level at defined range	I/Q origin offset	Subframe power	Antenna 0 RS power and EVM	MBSFN*	Time alignment error
	EVM RMS, EVM peak	OFDM symbol power		PDSCH/Data*QPSK EVM	Antenna port
		Frequency, time error		PDSCH/Data*16 QAM EVM	***Power Statistics CCDF***

Option 048

Channel Scanner (up to 6)	***ID Scanner (up to 6)***	***Multipath Profile***	Control channel table	PMCH subframe power*	***Route Map***
Frequency or channels	RSRP/RSRQ dominance	Cell, group, sector ID	(P-SS, S-SS, PBCH, PCFICH, RS 0, RS 1, RS 2**, RS 3**, MBSFN RS*)	Time alignment error	RSRP
Cell, group, sector ID	S-SS RSSI dominance	Ant 0 RS Ec/Io, delay		Time offset	RSRQ
Channel power	S-SS Ec/Io dominance	Ant 1 RS Ec/Io, delay		***Datagram***	RS-SINR
RSRP/RSRQ	Cell, group, sector ID	Ant 2 RS Ec/Io**, delay**	Absolute power	Datagram	S-SS RSSI
RS-SINR	RSRP/RSRQ	Ant 3 RS Ec/Io**, delay**	Relative power	Resource block power	P-SS/S-SS Power
Antenna port	RS-SINR/S-SS RSSI	***Control Channel***	EVM RMS, phase	Data utilization	S-SS Ec/Io
	P-SS/S-SS Power	RS power trend	Frequency error		
	S-SS Ec/Io	Cell, group, sector ID			

Longitude, latitude, and satellite in all screens

*Measurement is performed when MBMS is enabled.

**Measurement is performed when option 030 is enabled.

LTE/LTE-Advanced— TDD Signal Analyzer (Options 029/031/033 and 049)

General Parameters		
Frequency range	Band 33 to 43	
Input signal level	–40 to +25 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 029/031/033

Channel Power	***Spurious Emissions***	Data EVM peak	***Subframe***	Antenna 3 RS power and EVM**	PDSCH/Data* 64 QAM EVM
Channel power	Peak frequency at defined range	Frequency error	MBSFN*		PDSCH 256QAM EVM
Spectral density		Time error	Subframe summary table (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/Data* QPSK, PDSCH/Data* 16 QAM, PDSCH/Data* 64 QAM, PDSCH 256QAM)	Cell, group, sector ID	Data EVM RMS, peak
Peak to average power	Peak level at defined range	***Data Channel***		***Data Allocation Map***	RS, P-SS, S-SS EVM
Occupied Bandwidth		MBSFN*		Data allocation vs frame	RS, P-SS, S-SS power
Occupied bandwidth	***Power vs. Time (frame)***	Resource block power		Resource block power	PBCH power
Integrated power	Frame average power	I/Q diagram		OFDM symbol power	Subframe power
Occupied power	Subframe power	RB power		Data utilization	OFDM power
Spectrum Emission Mask	First slot power	Modulation format	EVM, relative or absolute power, modulation type	Data allocation vs subframe	Time error
Reference power	Second slot power	I/Q origin offset			I/Q origin offset
Peak level at defined range	Cell ID, I/Q origin offset	EVM RMS, EVM peak	Subframe power	Resource block power	***Carrier Aggregation****
	Time offset	***Control Channel***	OFDM symbol power	Data utilization	Component carriers: up to 5
ACLR	***Power vs. Time (slot)***	Control channel summary (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*)	Frequency, time error	***Auto Measure***	
Reference power	Slot average power		Data EVM RMS, peak	Channel power	Subframe power
Abs power at defined range	Transient period length		RS EVM RMS, peak	Occupied bandwidth	P-SS, S-SS, PBCH, RS power and EVM
	Off power		Cell, group, sector ID	Spectrum emission mask	
Rel power at defined range	***Constellation***	EVM, relative or absolute power, modulation type	***Time Alignment Error***	ACLR	PDSCH/Data* QPSK power and EVM
	MBSFN*		Time alignment error trend	Mult-ACLR	
Multi-ACLR	RS TX power	Each control channels'	Time alignment error	Spurious emission mask	PDSCH/Data* 16 QAM power and EVM
Lowest reference power	PDSCH/Data* QPSK EVM	I/Q diagram	RS power difference	Slot average power	
Highest reference power	PDSCH/Data* 16 QAM EVM	Modulation format	Antenna 0 RS power and EVM	Off power	PDSCH/Data* 64 QAM power and EVM
Abs power at defined range		Frequency error		Transition period	PDSCH 256QAM EVM
Rel power at defined range	PDSCH/Data* 64 QAM EVM	I/Q origin offset	Antenna 1 RS power and EVM	Time alignment error	Cell ID
		EVM RMS, EVM peak		MBSFN*	Frequency error
	PDSCH 256QAM EVM		Antenna 2 RS power and EVM**	PDSCH/Data* QPSK EVM	Time alignment error
					Antenna port
	Data EVM RMS				***Power Statistics CCDF***

Option 049

Channel Scanner (up to 6)	***ID Scanner (up to 6)***	***Multipath Profile***	***Control Channel***	EVM RMS, phase	***Route Map***
	RSRP/RSRQ dominance	Cell, group, sector ID	RS power trend	Frequency error	RSRP
Frequency or channels	S-SS RSSI dominance	Ant 0 RS Ec/Io, delay	Cell, group, sector ID	PMCH subframe power*	RSRQ
Cell, group, sector ID	S-SS Ec/Io dominance	Ant 1 RS Ec/Io, delay	Control channel table (P-SS, S-SS, PBCH, PCFICH, RS 0, RS 1, RS 2**, RS 3**, MBSFN RS*)	Time alignment error	RS-SINR
Channel power	Cell, group, sector ID	Ant 2 RS Ec/Io**, delay**		Time offset	S-SS RSSI
RSRP/RSRQ	RSRP/RSRQ	Ant 3 RS Ec/Io**, delay**		***Datagram***	P-SS, S-SS power
RS-SINR	RS-SINR/S-SS RSSI			Datagram	S-SS Ec/Io
Antenna port	P-SS/S-SS power		Absolute power	Resource block power	
	S-SS Ec/Io		Relative power	Data utilization	

Longitude, latitude, and satellite in all screens

*Measurement is performed when MBMS is enabled.
**Measurement is performed when option 031 is enabled.

NB-IoT Signal Analyzer (Option 034)

General Parameters		
Operation Mode	In Band, Guard band, and Standalone	
Input signal level	–40 to +25 dBm	
Channel power accuracy	Channel power accuracy ±1.0 dB (typical)	
Supported bandwidths	180 kHz	
Anchor Carrier definition	PRBS Index or Frequency	
Measurement Type	Frame, Subframe	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
Residual EVM (RMS)	2.0% (typical)	Data EVM

Measurement		
Option 034		
RF Analysis		**Modulation Analysis**
Channel Power	***Spectrum Emission Mask***	***IQ Diagram*** Constellation diagram, Modulation Format, Frequency error, IQ Origin offset, EVM RMS/Peak
Channel power	Reference Power	
Spectral density	Peak level at defined range	
Peak to average Power	***ACLR***	
Occupied bandwidth	Reference Power	***Channel Summary*** EVM, Power (dBm), and Modulation type of: Frame (Subframe) Power, NPSS, NSSS, NPBCH, NPDSCH, NRS0 (NRS1), PCI
Occupied Bandwidth	Abs. power at defined range	
Integrated Power	Rel. power at defined range	
Occupied power	***Spurious Emission***	
	Peak frequency at defined range	
	Peak level at defined range	

EMF Analyzer (Option 050)

General Parameters	
Supported Antenna	Isotropic Antenna G700050380 26 MHz to 3 GHz
Mode	Sweep / FFT
Trace	X-Axis, Y-Axis, Z-Axis, Current, Isotropic, Isotropic Accumulated
Limit lines	MSL, ICNIRP
Dwell Time	1 to 60s
Measurement Time	1 to 30 min (# of measurement= Measurement Time / (Dwell Time x 3)
Units	dBµV/m, dBmV/m, dBV/m, V/m, W/m^2, dBm/m^2, dBW/m^2, A/m, dBA/m, and Watt/cm^2.
Miscellaneous	Spectrum logging and Replay Export to CSV PDF Report Generation

Measurement		
Option 050 and G700050380		
Trace: X-Axis, Y-Axis, Z-Axis, Current, Isotropic, Isotropic Accumulated	Isotropic EMF Power: AVG, Max, Min	Accumulated Isotropic EMF Power: AVG, Max, Min

RFoCPRI™ Interference Analyzer (Option 008, 060, 061, 062, 063, 064, 065, and 066)

General Parameters		
Optical interface	Dual SFP/SFP+ (supports all MSA compliant SFP modules)	
Line rates	614.4 Mbps (1x) , 1228.8 Mbps (2x)	Option 008 and 060
	2457.6 Mbps (4x)	Option 008 and 061
	3072.0 Mbps (5x)	Option 008 and 062
	4915.2 Mbps (8x)	Option 008 and 063
	6144.0 Mbps (10x)	Option 008 and 064
	9830.4 Mbps (16x)	Option 008 and 065
	10137.6 Mbps (20x)*	Option 008 and 066
Resolution Bandwidth (RBW)		
–3 dB bandwidth	1 kHz to 10 kHz (span ≤ 3.84 MHz) 1 KHz to 100 kHz (3.84 MHz < span < 30.86 MHz)	1-3-10 sequence
Accuracy	±10% (nominal)	
VBW		
–3 dB bandwidth	1 Hz to 100 KHz	1-3-10 sequence
Accuracy	±10% (nominal)	
CPRI Parameter		
IQ Sample width	4 – 20 bits	
Mapping method	1 and 3	
TX clock	Internal/External/Recovered	
Port type	Master/Slave	
Map position	AxC#0 – AxC#7	
Bandwidth	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz	

Measurements				
Layer-2 Monitoring		**Layer-2 Term**		**Interference analyzer**
Port 1	***Port 2***	***Port 1 or 2 (exclusive)***		Spectrum
LOS	LOS	LOS SDI		Interference ID
LOF	LOF	LOF RAI		Sound Indicator
SDI	SDI	Optic RX level	dBm	Spectrogram
RAI	RAI	Optic TX level	dBm	RSSI
Optic RX level	Optic RX level	Protocol version	1 to 10	Spectrum Replayer
SFP Information	***SFP Information***	C and M HDLC rate (kbps)	No HDLC, 240, 480, 960, 1920, 2400	Dual Spectrum
Wavelength	Wavelength			Dual Spectrogram
Vendor	Vendor	C and M Ethernet subchannel number	20 to 63	Quad Spectrum
Vendor PN	Vendor PN			**PIM Detection**
Vendor rev	Vendor rev	***Alarm Injection***		Single carrier
Power level type	Power level type	R-LOS	Single	Multi carrier
Diagnostic byte	Diagnostic byte	R-LOF	Single	PIM calculator
Nominal rate	Nominal rate	***Error Injection***		
Min rate	Min rate	Code	Single/rate	
Max RX level	Max RX level	K30.7	Single/rate	
Max TX level	Max TX level	Error rate	1E-3 to 1E-9	

*Layer-2 Term is not supported.

RFoCPRI™ GSM Interference Analyzer (Option 068)

General Parameters					
Optical interface		Dual SFP/SFP+ (supports all MSA compliant SFP modules)			
Line rates		614.4 Mbps (1x), 1228.8 Mbps (2x), 2457.6 Mbps (4x), 3072.0 Mbps (5x), 4915.2 Mbps (8x), 6144.0 Mbps (10x), 9830.4 Mbps (16x)			
Resolution Bandwidth (RBW)		1 KHz to 30 kHz (Span≤960 kHz)			
		Accuracy	±10% (nominal)		
Video Bandwidth (RBW)		1 Hz to 30 KHz			
		Accuracy	±10% (nominal)		
CPRI Parameter					
IQ Sample Width		4 – 20 bits			
Sample Rate		960 KHz			
Mapping		NA=1, S=1, K=4, NC=1			
TX clock		Internal/External/Recovered			
Port type		Master/Slave			
General Parameters					
Layer-2 Monitoring		**Layer-2 Term**		**Layer-2 Term (cont.)**	
Port 1	**Port 2**	**Port 1 or 2 (exclusive)**		**Error**	
LOS	LOS	LOS	Error rate	Code	Single/rate
LOF	LOF	LOF	K30.7	Error rate	Single/rate
RAI	RAI	Optic RX level	dBm	K30.7	
SDI	SDI	Optic TX level	dBm	**Interference analyzer**	
Optic RX level	Optic RX level	Port Type	Master	Spectrum	
SFP Information	**SFP Information**	Protocol Version	1 to 10	Sound indicator	
Wavelength	Wavelength	C&M HDLC rate (kbps)	No HDLC, 240, 480, 960, 1920, 2400	Interference ID	
Vendor	Vendor	C&M Ethernet Sub-channel number	20 to 63	Spectrogram	
Vendor PN	Vendor PN	Word Sync Loss Event		RSSI	
Vendor rev	Vendor rev	Code Violation		Spectrum Replayer	
Power level type	Power level type	K30.7 words		Dual Spectrum	
Diagnostic byte	Diagnostic byte	Frame Sync Loss Events		Dual Spectrogram	
Nominal rate	Nominal rate	**Alarm Injection**		Quad Spectrum	
Min rate	Min rate	R-LOS	SDI	**PIM Detection**	
Max RX level	Max RX level	R-LOF	RAI	Single Carrier	
Max TX level	Max TX level			Multi Carrier	
				PIM Calculator	

RFoOBSAI™ Interference Analyzer (Option 070, 071, 072, 073)

General Parameters		
Optical interface	Dual SFP/SFP+ (supports all MSA compliant SFP modules)	
Line rates	768 Mbps (1x)	Option 008 and 070
	1536 Mbps (2x)	Option 008 and 071
	3072 Mbps (4x)	Option 008 and 072
	6144 Mbps (8x)	Option 008 and 073
Resolution bandwidth (RBW)	1 kHz to 10 kHz (span ≤ 3.84 MHz) 1 KHz to 100 kHz (3.84 MHz < span ≤ 30.86 MHz)	
	Accuracy	±10% (nominal)
Video bandwidth (RBW)	1 Hz to 100 kHz	
	Accuracy	±10% (nominal)
RP3 type	LTE (FDD/TDD), UMTS (FDD)	
RP3 address	Hexadecimal	
TX clock	Internal/External/Recovered	
Port type	Master/Slave	
Bandwidth	LTE-FDD/TDD: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz UMTS: 3 MHz for downlink, 5 MHz for uplink	
RP3 address list	RP3 address, Technology, Scrambler seed*, Message Count*	
Scrambler seed	Nx7 Index: 0 – 17, step 1	

Measurements				
Layer-2 Monitoring		**Layer-2 Term**		**Interference analyzer**
Port 1	***Port 2***	***Port 1 or 2***		Spectrum
LOS	LOS	LOS		Interference ID
LOF	LOF	LOF		Sound Indicator
Code violation	Code violation	Optic RX level	dBm	Spectrogram
K30.7 words	K30.7 words	Optic TX level	dBm	RSSI
Optic RX level	Optic RX level	Port type	Master	Spectrum Replayer
Optic TX level	Optic TX level	TX state	State machine	Dual Spectrum
Messages address	Message address	RX state	State machine	Dual Spectrogram
Message counter	Message counter	TX address	RP3 address (hexadecimal)	Quad Spectrum
SFP Information	***SFP Information***	RX address	RP3 address (hexadecimal)	**PIM Detection**
Wavelength	Wavelength	Word sync loss event		Single Carrier
Vendor	Vendor	Code violation		Multi Carrier
Vendor PN	Vendor PN	K30.7 words		PIM Calculator
Vendor rev	Vendor rev	Frame sync loss events		
Power level type	Power level type	***Alarm Injection***		
Diagnostic byte	Diagnostic byte	K30.7	Single	
Nominal rate	Nominal rate	***Error Injection***		
Min rate	Min rate	Code	Single/rate	
Max RX level	Max RX level	Error rate	1E-3 to 1E-9	
Max TX level	Max TX level			

*Available only when the link rate is 6.1 Gbps

RFoCPRI LTE-FDD Signal Generator (Option 081)

General Parameters		
Optical interface	Dual SFP/SFP+ (supports all MSA compliant SFP modules)	
Line rates	614.4 Mbps (1x), 1228.8 Mbps (2x), 2457.6 Mbps (4x), 3072.0 Mbps (5x), 4915.2 Mbps (8x), 6144.0 Mbps (10x), 9830.4 Mbps (16x)	
IQ Sample width	8 – 20 bits	
Mapping method	1 and 3	
Waveform	CW: Single Tone, Two tones LTE-FDD waveform: E-TM1.1, E-TM1.2, E-TM2, E-TM3.1, E-TM3.2, E-TM3.3	
Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz	
Sampling Frequency	N x 3.84 MHz (N=2, 4, 6, 8)	
Gain dynamic range	0 to −50 dB	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
Residual EVM (RMS)	0.2% (typical)	Data EVM

RFoCPRI™ LTE-TDD Signal Generator (Option 082)

General Parameters	
Optical Hardware (Option 008)	
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules), one Ethernet port
CPRI Parameter	
Line coding	8B/10B
Line rates	614.4 Mbps (1x), 1228.8 Mbps (2x), 2457.6 Mbps (4x), 3072.0 Mbps (5x), 4915.2 Mbps (8x), 6144.0 Mbps (10x), 9830.4 Mbps (16x)
CPRI Parameter	
IQ Sample width	8 – 20 bits
Mapping method	1 and 3
Waveform	CW: Single Tone, Two Tones LTE-TDD waveform: E-TM1.1, E-TM1.2, E-TM2, E-TM3.1, E-TM3.2, E-TM3.3
Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz
Sampling Frequency	N x 3.84 MHz (N=2, 4, 6, 8)
Gain dynamic range	0 to −50 dB
Frequency error	±10 Hz + ref freq accuracy, 99% confidence level
Residual EVM (RMS)	0.02% (typical), data EVM

RFoCPRI LTE-FDD Multi Carrier Signal Generator (Option 083)

General Parameters		
Optical Hardware (Option 008)		
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules)	
Max TX	4 carriers / SFP port, Dual port operation is available	
CPRI Parameter		
Line coding 8B/10B	Line coding 8B/10B	
Line rates	614.4 Mbps (1x), 1228.8 Mbps (2x), 2457.6 Mbps (4x), 3072.0 Mbps (5x), 4915.2 Mbps (8x), 6144.0 Mbps (10x), 9830.4 Mbps (16x)	
IQ Sample width	8 – 20 bits	
Waveform mapping	Carrier / TX Container /Map Position	
Mapping Method	1 and 3	
Waveform	CW, CW (two tone), LTE-FDD E-TM1.1, E-TM1.2, E-TM2, E-TM3.1, E-TM3.2, E-TM3.3, Custom	
Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz	
Sampling Frequency	N x 3.84 MHz (N=2, 4, 6, 8)	
Gain dynamic range	0 to –50 dB	
Frequency error	±10 Hz + ref freq accuracy, 99% confidence level	
Residual EVM (RMS)	0.02% (typical), Data EVM	
Measurement		
PIM Analysis (Option 101)		
Single Port Sweep mode	**Multi Port Sweep Mode**	**Multi Port Wideband Mode**
Possible PIM Order	Possible PIM Order	Flatness
Possible PIM Frequency	Possible PIM Frequency	Level Diff
PIM level	PIM level	Possible PIM
PIM Detection with Two CW Tones		PIM Detection with up to 8 LTE carriers (2 SFP ports x 4 carriers)

RFoCPRI LTE-TDD Multi Carrier Signal Generator (Option 084)

General Parameters		
Optical Hardware (Option 008)		
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules)	
Max TX	4 carriers / SFP port, Dual port operation is available	
CPRI Parameter		
Line coding 8B/10B	Line coding 8B/10B	
Line rates	614.4 Mbps (1x), 1228.8 Mbps (2x), 2457.6 Mbps (4x), 3072.0 Mbps (5x), 4915.2 Mbps (8x), 6144.0 Mbps (10x), 9830.4 Mbps (16x)	
IQ Sample width	8 – 20 bits	
Waveform mapping	Carrier / TX Container /Map Position	
Mapping Method	1 and 3	
Waveform	CW, CW (two tone), LTE-FDD E-TM1.1, E-TM1.2, E-TM2, E-TM3.1, E-TM3.2, E-TM3.3, Custom	
Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz	
Sampling Frequency	N x 3.84 MHz (N=2, 4, 6, 8)	
Gain dynamic range	0 to –50 dB	
Frequency error	±10 Hz + ref freq accuracy, 99% confidence level	
Residual EVM (RMS)	0.02% (typical), Data EVM	
Measurement		
PIM Analysis (Option 101)		
Single Port Sweep mode	**Multi Port Sweep Mode**	**Multi Port Wideband Mode**
Possible PIM Order	Possible PIM Order	Flatness
Possible PIM Frequency	Possible PIM Frequency	Level Diff
PIM level	PIM level	Possible PIM
PIM Detection with Two CW Tones		PIM Detection with up to 8 LTE carriers (2 SFP ports x 4 carriers)

RFoOBSAI™ LTE-FDD Signal Generator (Option 086)

General Parameters	
Optical Hardware (Option 008)	
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules), one Ethernet port
OBSAI Parameter	
Line coding	8B/10B
Line rates	768 Mbps (Option 070)
	1536 Mbps (Option 071)
	3072 Mbps (Option 072)
	6144 Mbps (Option 073)
CPRI Parameter	
RP3 type	LTE
RP3 address	Hexadecimal
Waveform	CW: Single Tone, Two Tones Waveform: E-TM1.1, E-TM1.2, E-TM2, E-TM3.1, E-TM3.2, E-TM3.3, Custom
Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz
Sampling frequency	N x 3.84 MHz (N=2, 4, 6, 8)
Gain dynamic range	0 to −50 dB
Frequency error	±10 Hz + ref freq accuracy, 99% confidence level
Residual EVM (RMS)	0.02% (typical), data EVM

RFoCPRI LTE-FDD Signal Analyzer (Option 091)

General Parameters		
Optical interface	Dual SFP/SFP+ (supports all MSA compliant SFP modules)	
Line rates	614.4 Mbps (1x), 1228.8 Mbps (2x), 2457.6 Mbps (4x), 3072.0 Mbps (5x), 4915.2 Mbps (8x), 6144.0 Mbps (10x), 9830.4 Mbps (16x)	
RBW	100 kHz	
IQ Sample width	Downlink: 8 – 20 bits	
Mapping method	1 and 3	
AxC Container/Carrier	Up to 8 AxC container per carrier	
LTE Signal Bandwidth	5 MHz, 10MHz, 15MHz, 20MHz	
Span	Fixed and equal to sampling frequency of LTE signal.	
Frequency error	±10 Hz + ref freq accuracy	99% confidence level
Residual EVM (RMS)	0.02% (typical)	Data EVM

Measurements

Option 091

Channel Power	***Power vs. Time (frame)***	***Control Channel***	Data EVM RMS, peak	Antenna 1 RS power and EVM
Channel power	Frame average power	Control channel summary (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*)	RS EVM RMS, peak	
Spectral density	Subframe power		Cell, group, sector ID	***Data Allocation Map***
Peak to average power	First slot power		***Frame***	Data allocation vs frame
Occupied Bandwidth	Second slot power		MBSFN*	Resource block power
Occupied bandwidth	Cell ID, I/Q origin offset	EVM, relative or absolute power, modulation type	Frame summary table (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/Data* QPSK, PDSCDH/Data* 16 QAM, PDSCH/Data* 64 QAM)	OFDM symbol power
Integrated power	***Constellation***			Data utilization
Occupied power	MBSFN*	Each control channels'		Data allocation vs subframe
	RS TX power	I/Q diagram		Resource block power
	PDSCH/Data* QPSK EVM	Modulation format		Data utilization
	PDSCH/Data* 16 QAM EVM	Frequency error		***Power Statistics CCDF***
		I/Q origin offset	EVM, relative or absolute power, modulation type	Average Power
	PDSCH/Data* 64 QAM EVM	EVM RMS, EVM peak		Peak Power Crest Factor
		Subframe	Frame average power	
	Data EVM RMS	MBSFN*	OFDM symbol power	
	Data EVM peak	Error rate	Frequency error	
	Frequency error	Subframe summary table (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/Data* QPSK, PDSCH/Data* 16 QAM, PDSCH/Data* 64 QAM)	I/Q origin offset	
	Time error		EVM RMS, peak	
	Data Channel		Data EVM RMS, peak	
	MBSFN*		Cell, group, sector ID	
	Resource block power		***Time Alignment Error***	
	I/Q diagram		Time alignment error trend	
	RB power modulation format	EVM, relative or absolute power, modulation type	Time alignment error	
			RS power difference	
	I/Q origin offset	Subframe power	Antenna 0 RS power and EVM	
	EVM RMS, EVM peak	OFDM symbol power		
		Frequency, time error		

*Measurement is performed when MBMS is enabled.

RFoCPRI™ LTE-TDD Signal Analyzer (Option 092)

General Parameters	
Optical Hardware (Option 008)	
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules), one Ethernet port
CPRI Parameter	
Line coding	8B/10B
Line rates	614.4 Mbps (1x), 1228.8 Mbps (2x), 2457.6 Mbps (4x), 3072.0 Mbps (5x), 4915.2 Mbps (8x), 6144.0 Mbps (10x), 9830.4 Mbps (16x)
Resolution Bandwidth (RBW)	
–3 dB bandwidth	100 kHz
Accuracy	±10% (nominal)
CPRI Parameter	
IQ Sample width	8 – 20 bits
Mapping method	1 and 3
TX clock	Internal/External/Recovered
Port type	Master/Slave
Map position	AxC#0 – AxC#7
Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz
Span	Fixed and equal to sampling frequency of LTE signal
Frequency error	±10 Hz + ref freq accuracy, 99% confidence level
Residual EVM (RMS)	0.02% (typical), data EVM

Measurements

Option 008, 060, 061, 062, 063, 064, and 065

Channel Power	***Constellation***	***Data Channel***	***Time Alignment Error***	***Data Allocation Map***
Channel power	MBSFN*	MBSFN*	Time alignment error trend	Data allocation vs. frame
Spectral density	RS TX power	Resource block power	Time alignment error	Resource block power
Peak to average power	PDSCH/Data* QPSK EVM	I/Q diagram	RS power difference	OFDM symbol power
Occupied Bandwidth	PDSCH/Data* 16QAM EVM	RB power	Antenna 0 RS power, EVM	Data utilization
Occupied bandwidth	PDSCH/Data* 64QAM EVM	Modulation format	Antenna 1 RS power, EVM	Data allocation vs.subframe
Integrated power	Data EVM RMS, peak	I/Q origin offset	Cell, group, sector ID	Resource block power
Occupied power	Frequency error	EVM RMS, peak		Data utilization
Power vs. Time (Frame)	Time error	***Subframe***		***Power Statistics CCDF***
Frame average power	***Control Channel***	MBSFN*		Average power
Subframe power	Control Channel summary EVM, rel., or abs. power of each control channel	Subframe summary		Peak power crest factor
First Slot power		EVM, abs. and rel. power		
Second Slot power		Subframe power		
Cell ID, I/Q origin offset	IQ diagram	OFDM symbol power		
Time offset	Modulation format	Frequency error		
Power vs. Time (Slot)	Frequency error	Time error		
Slot average power	I/Q origin offset	Data EVM RMS, peak		
Transient period length	Control EVM RMS, peak	RS EVM RMS, peak		
Off power		Cell, group, sector ID		

Longitude, latitude, and satellite in all screens

*Measurement is performed when MBMS is enabled.

RFoOBSAI™ LTE-FDD Signal Analyzer (Option 096)

General Parameters	
Optical Hardware (Option 008)	
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules), one Ethernet port
OBSAI Parameter	
Line coding	8B/10B
Line rates	768 Mbps (Option 070)
	1536 Mbps (Option 071)
	3072 Mbps (Option 072)
	6144 Mbps (Option 073)
Resolution Bandwidth (RBW)	
–3 dB bandwidth	100 kHz
Accuracy	±10% (nominal)
OBSAI Parameter	
RP3 type	LTE-FDD
RP3 address	Hexadecimal
TX clock	Internal/External/Recovered
Port type	Master/Slave
Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz
RP3 address list	RP3 address, technology, scrambler seed*, message count
Scrambler seed	Nx7 Index: 0 – 17, step 1

Measurements				
Channel Power	***Constellation***	***Data Channel***	***Time Alignment Error***	***Data Allocation Map***
Channel power	MBSFN**	MBSFN**	Time alignment error trend	Data allocation vs. frame
Spectral density	RS TX power	Resource block power	Time alignment error	Resource block power
Peak to average power	PDSCH/data** QPSK EVM	I/Q diagram	RS power difference	OFDM symbol power
Occupied Bandwidth	PDSCH/data** 16QAM EVM	RB power	Antenna 0 RS power, EVM	Data utilization
Occupied bandwidth	PDSCH/data** 64QAM EVM	Modulation format	Antenna 1 RS power, EVM	Data allocation vs. subframe
Integrated power	Data EVM RMS, peak	I/Q origin offset	Cell, group, sector ID	Resource block power
Occupied power	Frequency error	EVM RMS, peak	***Frame***	Data utilization
Power vs. Time (frame)	Time error	***Subframe***	MBSFN**	
Frame average power	***Control Channel***	MBSFN**	Frame summary	
Subframe power	Control channel summary EVM, rel., or abs power of each control channel	Subframe summary	EVM, abs. and rel. power	
First slot power		EVM, abs. and rel. power	Frame average power	
Second slot power		Subframe power	OFDM symbol power	
Cell ID, I/Q origin offset	IQ Diagram	OFDM symbol power	Frequency error	
Time offset	Modulation format	Frequency error	IQ origin offset	
Power Statistics CCDF	Frequency error	Time error	Data EVM RMS, peak	
Average power	I/Q origin offset	Data EVM RMS, peak	Control EVM RMS, peak	
Peak power Crest Factor	Control EVM RMS, peak	RS EVM RMS, peak	Cell, group, sector ID	
		Cell, group, sector ID		

Longitude, latitude, and satellite in all screens

*OBSAI 6144 Mbps only.
**Measurement is performed when MBMS is enabled.

RFoCPRI BBU-Emulation for Alcatel-Lucent (Option 101)

General Parameters	
Optical Hardware (Option 008)	
Interface	Dual SFP/SFP+ (supports all MAS-compliant SFP modules)
Max TX	4 Carriers/ SFP Port with Option 083 or 084, Dual port operation
CPRI parameter	
Line Coding	8B/10B
Line Rate	614.4 Mbps (1x), 1228.8 Mbps (2x), 2457.6 Mbps (4x), 3072.0 Mbps (5x), 4915.2 Mbps (8x), 6144.0 Mbps (10x), 9830.4 Mbps (16x)
Sampling Rates (fs)	3.84 MHz, 7.68 MHz, 15.36 MHz, 23.04 MHz, 30.72MHz
Channel Bandwidth	3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz,
NV (NC*K-NA*s)	0
IQ Sample width	4 – 20 bits
Mapping Method	1 and 3
TX Clock	Internal, External, Recovered
Port Type	Master

Measurements

Option 101		Option 101 and 081 (082)	Option 101 and 083 (084)
Configuration Verification: Carrier Information	***RET Information***	***Coverage Range***	***PIM Analysis-Single Port Sweep Mode***
RRH Description Carrier Information RRH Description	ALD Device Information Antenna Device Data Alarm Status	Spectrum, Downlink Power, Downlink VSWR, Uplink VSWR, Antenna Tilt	TX Power, Possible PIM Order, Possible PIM Frequency, PIM Level
Configuration Verification: CPRI & Active SW	***Spectrum Clearance***		***PIM Analysis-Multi Port Sweep Mode***
CPRI State Active SW	Spectrum Spectrogram RSSI Dual Spectrum Dual Spectrogram		TX Power, Possible PIM Order, Possible PIM Frequency, PIM Level
Configuration Verification: SFP Information	***Link Status***		***PIM Analysis-Multi Port Wideband Mode***
RRH Description SFP Information	LOS, LOF, RAI, SDI, Optic RX Level, Optic TX Level Protocol Version, C&M HDLC Rate, C&M Eth Sub-channel Number, Start-up Status, WSLE, CV, K30.7, FSLE		Spectrum, TX Power, Spectral Flatness
Configuration Verification: RTD Information			
RRH Description RTD Information			

Layer-2 BERT (Option 110)

General Parameters			
Optical interface	Dual SFP/SFP+ (supports all MSA compliant SFP modules)		
Line rates	614.4 Mbps (1x), 1228.8 Mbps (2x), 2457.6 Mbps (4x), 3072.0 Mbps (5x), 4915.2 Mbps (8x), 6144.0 Mbps (10x), 9830.4 Mbps (16x)		
TX clock	Internal/External/Recovered		
Port	SFP Port 1 and Port 2 (Dual independent operation)		
Port type	Master/Slave		
Alarm / Error Injection	Alarm	R-LOS/R-LOF/RAI/SDI	
	Error	Code/ K30.7/ Bit	
	Insert Type	Single/ Rate	
Bit Pattern	Live, Digital Word, ANSI 2^{23}-1, ANSI 2^{23}-1 Inv, ANSI 2^{31}-1, ANSI 2^{31}-1 Inv, ANSI 2^{20}-1, ANSI 2^{20}-1 Inv, ANSI 2^{15}-1, ANSI 2^{15}-1 Inv, ANSI 2^{11}-1, ANSI 2^{11}-1 Inv, ITU 2^{23}-1, ITU 2^{23}-1 Inv , ITU 2^{31}-1, ITU 2^{31}-1 Inv, ITU 2^{15}-1, ITU 2^{15}-1 Inv, ITU 2^{11}-1, ITU 2^{11}-1 Inv		
Bit Pattern Mapping mode	Bulk mode for whole payload		
	Channelized mode for AxC Group	Bandwidth: 5MHz, 10MHz, 15MHz, 20MHz	
		Map Position: AxC 0 - 7	
Round Trip Delay	Resolution: ns (min step: 1ns)		
Measurements			
Common			
LOS	RAI	Pattern Sync	Optic Rx level
LOF	SDI		Optic Tx level

BERT	**Count**	**L1 Inband**
Code Violation	Rx Code Words	RX Protocol Version
Code Violation Rate	Tx Code Words	Rx C&M HDLC Rate (kbps)
RX K30.7 Words	Rx Frame	Rx C&M Eth Subchannel Number
Word Sync Loss Events	Tx Frame	TX Protocol Version
Frame Sync Loss Events	Round Trip Delay	TX C&M HDLC Rate (kbps)
Bit Errors	Round Trip Delay (Offset)	TX C&M Eth Subchannel Number
Bit Error Rate	Round Trip Delay (avg)	Port Type
Svc Disruption (ms)	Round Trip Delay (min)	Start-up State
	Round Trip Delay (max)	

General Information

Inputs and Outputs		
RF in	Spectrum analyzer	
Connector	Type-N, female	
Impedance	50 Ω (nominal)	
Damage level	>+33 dBm, ±50 V DC (nominal), 3 min	
Reflection/RF out	Cable and antenna analyzer	
Connector	Type-N, female	
Impedance	50 Ω (nominal)	
Damage level	>+40 dBm, ±50 V DC (nominal), 3 min	
RF in	Cable and antenna analyzer	
Connector	Type-N, female	
Impedance	50 Ω (nominal)	
Damage level	>+25 dBm, ±50 V DC (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	
SFP Cage		
Port 1	RFoFiber (with option 008) SFP/SFP+ compatible	
Port 2	SFP/SFP+ compatible	
LAN[3]	RJ45, 10/100Base-T	
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: 800x600)	
Power		
External DC input	18 to 19 V DC	
Power consumption	42 W	54 W maximum (when charging battery)

Battery	
Type	10.8 V, 7800 mA/hr (Lithium ion)
Operating time	>3 hr (typical)
Charge time	3 hr (while not operating) 9 hr (while operating)
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)
Data Storage	
Internal[4]	Maximum 512 MB
External[5]	Limited by size of USB flash drive
Environmental	
Operating temperature	
AC power	0 to 40C (without derating on battery charging)
	-10 to 55C (with derating on battery charging)
Battery Operation	0 to 40C (without derating on battery operating time)
	-10 to 55C (with derating on battery operating time)
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)	4.4 kg (9.7 lb)
Size (W x H x D)	295 x 195 x 82 mm
Calibration Cycle	
1 year	

1. Connects flash drive, power sensor, EZ-Cal kit, fiber microscope, EMF Antenna, and AntennaAdvisor Handle.
2. Data transfer and PC Application based remote control.
3. Data transfer or PC Application/Web-based remote control.
4. 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.
5. Support USB 2.0 compatible memory devices. Support memory size up to 2GB (FAT formatted) and 32GB (FAT32 formatted). NTFS format is not supported.
6. With the battery pack removed.

Ordering Information

Description	Part Number
Standard CellAdvisor Base Station Analyzer	
Base station analyzer includes: · Spectrum analyzer 9 kHz to 8 GHz · RF power meter 10 MHz to 8 GHz · Cable and antenna 5 MHz to 6 GHz	JD785B[1,2]
Options Note: Upgrade options for the JD785B use the designation JD785BU before the respective last three-digit option number	
2 Port transmission measurements for JD785B [3]	JD785B001
Bias Tee for JD785B[4]	JD785B002
CW signal generator for JD785B	JD785B003
Optical hardware for JD785B[5]	JD785B008
GPS receiver and antenna for JD785B	JD785B010
Interference analyzer for JD785B[6,7]	JD785B011
Channel scanner for JD785B	JD785B012
Bluetooth connectivity for JD785B[8]	JD785B013
LTE-FDD RAN performance indicator for JD785B[9]	JD785B014
LTE-TDD RAN performance indicator for JD785B[10]	JD785B015
Wi-Fi connectivity for JD785B[11]	JD785B016
cdmaOne/cdma2000 analyzer for JD785B	JD785B020
EV-DO analyzer for JD785B[12]	JD785B021
GSM/GPRS/EDGE analyzer for JD785B	JD785B022
WCDMA/HSPA+ analyzer for JD785B	JD785B023
TD-SCDMA analyzer for JD785B	JD785B025
Mobile WiMAX analyzer for JD785B	JD785B026
LTE - FDD analyzer for JD785B[13]	JD785B028
LTE - TDD analyzer for JD785B[13]	JD785B029
LTE Advanced - FDD analyzer for JD785B[14,15]	JD785B030
LTE Advanced - TDD analyzer for JD785B[15,16]	JD785B031
LTE-FDD 256 QAM Demodulator for JD785B[17]	JD785B032
LTE-TDD 256 QAM Demodulator for JD785B[18]	JD785B033
NB-IoT Analyzer for JD785B[14]	JD785B034
cdmaOne/cdma2000 OTA analyzer for JD785B[19]	JD785B040
EV-DO OTA analyzer for JD785B[19]	JD785B041
GSM/GPRS/EDGE OTA analyzer for JD785B [19]	JD785B042
WCDMA/HSPA+ OTA analyzer for JD785B[19]	JD785B043
TD-SCDMA OTA analyzer for JD785B[19]	JD785B045
Mobile WiMAX OTA analyzer for JD785B[19]	JD785B046
LTE - FDD OTA analyzer for JD785B[19]	JD785B048
LTE - TDD OTA analyzer for JD785B[19]	JD785B049
EMF analyzer for JD785B[20]	JD785B050
RFoCPRI 614M & 1.2G interference analyzer for JD785B[21,22]	JD785B060
RFoCPRI 2.4G interference analyzer for JD785B[21,22]	JD785B061
RFoCPRI 3.1G interference analyzer for JD785B[21,22]	JD785B062
RFoCPRI 4.9G interference analyzer for JD785B[21,22]	JD785B063
RFoCPRI 6.1G interference analyzer for JD785B[21,22]	JD785B064
RFoCPRI 9.8G interference analyzer for JD785B[21,22]	JD785B065
RFoCPRI 10.1G interference ananlyzer for JD785B[21,22]	JD785B066
RFoCPRI GSM interference analyzer for JD785B[21,22,23]	JD785B068
RFoOBSAI 768M Interference analyzer for JD785B[21,22]	JD785B070
RFoOBSAI 1.5G interference analyzer for JD785B[21,22]	JD785B071
RFoOBSAI 3.1G interference analyzer for JD785B[21,22]	JD785B072
RFoOBSAI 6.1G interference analyzer for JD785B[21,22]	JD785B073
RFoCPRI LTE-FDD signal generator for JD785B[21,22,23]	JD785B081
RFoCPRI LTE-TDD signal generator for JD785B[21,22,23]	JD785B082
RFoCPRI LTE-FDD multi carrier signal generator for JD785B[21,22,24]	JD785B083
RFoCPRI LTE-TDD multi carrier signal generator for JD785B[21, 22, 25]	JD785B084
RFoOBSAI LTE-FDD signal generator for JD785B[21,22,26]	JD785B086
RFoCPRI LTE-FDD signal analyzer for JD785B[21,22,23]	JD785B091
RFoCPRI LTE-TDD signal analyzer for JD785B[21,22,23]	JD785B092
RFoOBSAI LTE-FDD signal analyzer for JD785B[21,22,26]	JD785B096
BBU Emulation for AT&T for JD785B[21,22]	JD785B100
ALU BBU emulation for JD785B[21,22]	JD785B101
CPRI Layer-2 BERT for JD785B[21,22]	JD785B110
Reserved for VZW[21, 22]	JD780B102
2 port transmission measurements floating license for JD740B/JD780B	JD780B001-FL
GPS receiver and antenna floating license for JD740B/JD780B	JD780B010-FL
Interference analyzer floating license for JD740B/JD780B	JD780B011-FL
Channel scanner floating license for JD740B/JD780B	JD780B012-FL
Bluetooth connectivity floating license for JD740B/JD780B	JD780B013-FL
LTE-FDD RAN performance indicator floating license for JD740B/JD780B	JD780B014-FL
LTE-TDD RAN performance indicator floating license for JD740B/JD780B	JD780B015-FL
Wi-Fi connectivity floating license for JD740B/JD780B	JD780B016-FL
cdmaOne/cdma2000 analyzer floating license for JD740B/JD780B	JD780B020-FL
EV-DO analyzer floating license for JD740B/JD780B	JD780B021-FL
GSM/GPRS/EDGE analyzer floating license for JD740B/JD780B	JD780B022-FL
WCDMA/HSPA+ analyzer floating license for JD740B/JD780B	JD780B023-FL
TD-SCDMA analyzer floating license for JD740B/JD780B	JD780B025-FL
Mobile WiMAX analyzer floating license for JD740B/JD780B	JD780B026-FL
LTE - FDD analyzer floating license for JD740B/JD780B	JD780B028-FL
LTE - TDD analyzer floating license for JD740B/JD780B	JD780B029-FL
LTE Advanced - FDD analyzer floating license for JD740B/JD780B	JD780B030-FL

Ordering Information (Continued)

Description	Part Number
LTE Advanced - TDD analyzer floating license for JD740B/JD780B	JD780B031-FL
LTE-FDD 256 QAM Demodulator floating license for JD740B/JD780B	JD780B032-FL
LTE-TDD 256 QAM Demodulator floating license for JD740B/JD780B	JD780B033-FL
NB-IoT Analyzer floating license for JD740B/JD780B	JD780B034-FL
cdmaOne/cdma2000 OTA analyzer floating license for JD740B/JD780B	JD780B040-FL
EV-DO OTA analyzer floating license for JD740B/JD780B	JD780B041-FL
GSM/GPRS/EDGE OTA analyzer floating license for JD740B/JD780B	JD780B042-FL
WCDMA/HSPA+ OTA analyzer floating license for JD740B/JD780B	JD780B043-FL
TD-SCDMA OTA analyzer floating license for JD740B/JD780B	JD780B045-FL
Mobile WiMAX OTA analyzer floating license for JD740B/JD780B	JD780B046-FL
LTE - FDD OTA analyzer floating license for JD740B/JD780B	JD780B048-FL
LTE - TDD OTA analyzer floating license for JD740B/JD780B	JD780B049-FL
EMF analyzer floating license for JD740B/JD780B	JD780B050-FL
RFoCPRI 614M & 1.2G interference analyzer floating license for JD740B/JD780B	JD780B060-FL
RFoCPRI 2.4G interference analyzer floating license for JD740B/JD780B	JD780B061-FL
RFoCPRI 3.1G interference analyzer floating license for JD740B/JD780B	JD780B062-FL
RFoCPRI 4.9G interference analyzer floating license for JD740B/JD780B	JD780B063-FL
RFoCPRI 6.1G interference analyzer floating license for JD740B/JD780B	JD780B064-FL
RFoCPRI 9.8G interference analyzer floating license for JD740B/JD780B	JD780B065-FL
RFoCPRI 10.1G interference ananlyzer floating license for JD740B/780B	JD780B066-FL
RFoCPRI GSM interference analyzer floating license for JD740B/JD780B	JD780B068-FL
RFoOBSAI 768M interference analyzer floating license for JD740B/JD780B	JD780B070-FL
RFoOBSAI 1.5G interference analyzer floating license for JD740B/JD780B	JD780B071-FL
RFoOBSAI 3.1G interference analyzer floating license for JD740B/JD780B	JD780B072-FL
RFoOBSAI 6.1G interference analyzer floating license for JD740B/JD780B	JD780B073-FL
RFoCPRI LTE-FDD signal generator floating license for JD740B/JD780B	JD780B081-FL
RFoCPRI LTE-TDD signal generator floating license for JD740B/JD780B	JD780B082-FL

Description	Part Number
RFoCPRI LTE-FDD multi carrier signal generator floating license for JD740B/JD780B	JD780B083-FL
RFoCPRI LTE-TDD multi carrier signal generator floating license for JD740B/JD780B	JD780B084-FL
RFoOBSAI LTE-FDD signal generator floating license for JD740B/JD780B	JD780B086-FL
RFoCPRI LTE-FDD signal analyzer floating license for JD740B/JD780B	JD780B091-FL
RFoCPRI LTE-TDD signal analyzer floating license for JD740B/JD780B	JD780B092-FL
RFoOBSAI LTE-FDD signal analyzer floating license for JD740B/JD780B	JD780B096-FL
BBU Emulation for AT&T floating license for JD740B/JD780B	JD780B100-FL
ALU BBU emulation floating license for JD740B/JD780B	JD780B110-FL
Optional Accessories	
Layer-2 BERT floating license for JD740B/JD780	JD780B101-FL
Accessory - RF Calibrators (General)	
Y- calibration kit Type-N(m), DC to 6 GHz, 50 ohm	JD78050509
Y- calibration kit DIN(m), DC to 6 GHz, 50 ohm	JD78050510
EZ-Cal kit Type-N(m), DC to 6 GHz, 50 ohm	JD70050509
Dual port Type-N 6 GHz calibration kit (Includes 1x JD78050509 Y- calibration kit, 2x G700050530 RF Cable, and 2x G700050575 RF Adapter Type-N(f) to Type-N(f))	JD78050507
Dual port DIN 6 GHz calibration kit (Includes 1x JD78050510 DIN Y- calibration kit, 2x G710050536 RF Cable, and 2x G700050572 RF Adapter DIN(m) to DIN(m)	JD78050508
50 ohm Load, DC to 4 GHz, 1 W	GC72550511
Accessory - RF Cables (Cables)	
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
RF cable DC to 18 GHz Type-N(m) to SMA(m), 1.5 m	G710050533
RF cable DC to 18 GHz Type-N(m) to QMA(m), 1.5 m	G710050534

Ordering Information (Continued)

Description	Part Number
RF cable DC to 18 GHz Type-N(m) to SMB(m),1.5 m	G710050535
RF cable DC to 6 GHz Type-N(m) to DIN(f), 1.5 m	G710050536
RF cable DC to 4 GHz Type-N(m) to 1.0/2.3 (m), 1.5 m	G710050537
Phase-stable RF cable w grip DC to 6 GHz Type-N(m) to Type-N(f), 1.5 m	G700050540
Phase-stable RF cable w grip DC to 6 GHz Type-N(m) to DIN(f), 1.5 m	G700050541
RF cable DC to 18 GHz Type-N(m) to Type-N(f), 1.5 m	G710050531
Accessory - Optic Cables (Cables)	
SM/LC T-Jumper and 1.5 m fiber cable	G700050401
MM/LC T-Jumper and 1.5 m fiber cable	G700050402
Accessory - RF Antennas (General)	
RF omni antenna Type-N(m), 806 to 896 MHz	G700050353
RF omni antenna Type-N(m), 870 to 960 MHz	G700050354
RF omni antenna Type-N(m), 1710 to 2170 MHz	G700050355
RF omni antenna Type-N(m), 720 to 800 MHz	G700050356
RF omni antenna Type-N(m), 2300 to 2700 MHz	G700050357
Mag mount RF omni antenna Type-N(m), 689 to 1200 MHz, 1700 to 2700 MHz, 3000 to 6000 MHz	G700050358
RF Omni Antenna N(m), 2.4 GHz to 2.5 GHz, 4.5 dBi, and 5.150 GHz to 5.850 GHz, 7 dBi	G700050359
RF yagi antenna Type-N(f), 1750 to 2390 MHz, 10.2 dBd	G700050363
RF yagi antenna Type-N(f), 806 to 896 MHz, 10.2 dBd	G700050364
RF yagi antenna Type-N(f), 866 to 960 MHz, 9.8 dBd	G700050365
RF yagi antenna SMA(f), 650 to 4000 MHz, 1.85 dBd	G700050366
RF yagi antenna SMA(f), 650 to 6000 MHz, 2.85 dBd	G700050367
Isotropic Antenna Type-N(m), 26 MHz to 3 GHz	G700050380
Accessory - RF Power Sensor (General)	
Directional power sensor (peak and average power) 300 to 3800 MHz	JD731B
Terminating power sensor (Average Power) 20 to 3800 MHz	JD732B
Directional power sensor (peak and average power) 150 to 3500 MHz	JD733A
Terminating power sensor (peak power) 20 to 3800 MHz	JD734B
Terminating power sensor (average/peak power) 20 to 3800 MHz	JD736B
Accessory - RF Adapters (Connector & Adapters)	
Adapter Type-N(m) to DIN(f), DC to 7.5 GHz, 50 ohm	G700050571
Adapter DIN(m) to DIN(m), DC to 7.5 GHz, 50 ohm	G700050572
Adapter Type-N(m) to SMA(f) DC to 18 GHz, 50 ohm	G700050573
Adapter Type-N(m) to BNC(f), DC to 4 GHz, 50 ohm	G700050574
Adapter Type-N(f) to Type-N(f), DC to 18 GHz 50 ohm	G700050575
Adapter Type-N(m) to DIN(m), DC to7.5 GHz, 50 ohm	G700050576
Adapter Type-N(f) to DIN(f), DC to 7.5 GHz, 50 ohm	G700050577
Adapter Type-N(f) to DIN(m), DC to 7.5 GHz, 50 ohm	G700050578
Adapter DIN(f) to DIN(f), DC to 7.5 GHz, 50 ohm	G700050579

Description	Part Number
Adapter Type-N(m) to Type-N(m), DC to 11 GHz 50 ohm	G700050580
Adapter N(m) to QMA(f), DC to 6.0 GHz, 50 ohm	G700050581
Adapter N(m) to QMA(m), DC to 6.0 GHz, 50 ohm	G700050582
Adapter N(m) to 4.1/9.5 MINI DIN (f), DC to 6.0 GHz, 50 ohm	G700050583
Adapter N(m) to 4.1/9.5 MINI DIN (m), DC to 6.0 GHz, 50 ohm	G700050584
Adapter N(m) to 4.3-10 (f), DC to 6.0 GHz, 50 ohm	G700050585
Adapter N(m) to 4.3-10 (m), DC to 6.0 GHz, 50 ohm	G700050586
Adapter Type-N(m) to DIN(f), DC to 4 GHz, 50 ohm	G710050571
Adapter N(f) to N(f), DC to 4 GHz, 50 ohm	G710050575
Adapter Type-N(f) to DIN(f), DC to 4 GHz, 50 ohm	G710050577
Adapter Type-N(f) to DIN(m), DC to 7 GHz, 50 ohm	G710050578
Accessory - RF Miscellaneous (General)	
Attenuator 40 dB, 100 W, DC to 4 GHz (unidirectional)	G710050581
RF directional coupler, 700 to 4000 MHz, 30 dB, 50 W Input/output; Type-N(m) to Type-N(f), tap off; Type-N(f)	G710050585
RF combiner, 700 to 4000 MHz, Type-N(f) to Type-N(m)	G710050586
4x1 RF combiner, 700 to 4000 MHz, Type-N(f) to Type-N(m)	G710050587
Bandpass filter 696 MHz to 716 MHz, N(m) to N(f), 50 ohm	G700050601
Bandpass filter 776 MHz to 788 MHz, N(m) to N(f), 50 ohm	G700050602
Bandpass filter 806 MHz to 849 MHz, N(m) to N(f), 50 ohm	G700050603
Bandpass filter 1710 MHz to 1755 MHz, N(m) to N(f), 50 ohm	G700050604
Bandpass filter 1850 MHz to 1910 MHz, N(m) to N(f), 50 ohm	G700050605
Bandpass filter 703 MHz to 748 MHz, N(m) to N(f), 50 ohm	G700050606
Bandpass filter 832 MHz to 862 MHz, N(m) to N(f), 50 ohm	G700050607
Bandpass filter 880 MHz to 915 MHz, N(m) to N(f), 50 ohm	G700050608
Bandpass filter 1710 MHz to 1785 MHz, N(m) to N(f), 50 ohm	G700050609
Bandpass filter 1920 MHz to 1980 MHz, N(m) to N(f), 50 ohm	G700050610
Bandpass filter 2500 MHz to 2570 MHz, N(m) to N(f), 50 ohm	G700050611
Accessory - General	
2 port USB hub	G700050200
USB Bluetooth dongle and dipole antenna 5 dBi	JD70050006
GPS antenna for JD740 and JD780 series	JD71050351
AntennaAdvisor handle	JD70050007
Cross LAN cable (6ft)	G700550335
USB A to B cable (1.8m)	GC73050515

Ordering Information (Continued)

Description	Part Number
> 1GB USB memory	GC72450518
Stylus pen	G710550316
Accessory - Battery & Chargers	
Rechargeable lithium ion battery	G710550325
JD700B series AC/DC power adapter_90 W_15 V	JD70050326
Automotive cigarette lighter/12V DC adapter	G710550323
External battery charger	G710550324
Accessory - Manual & Documentation	
JD700B series user's guide - printed version	JD700B362
Accessory - Carrying Case	
Soft carrying case	JD74050341
Hard carrying Case	JD71050342
Hard carrying case with wheels	JD70050342
CellAdvisor backpack carrying case	JD70050343
Optional TAP	
Optical nTAP, three-channel, 50 µm, MM, LC, 50/50 split ratio	TO3-M5-LC-55-K
Optical nTAP, three-channel, 9 µm, SM, LC, 50/50 split ratio	TO3-SM-LC-55-K
Optional SFP Transceiver	
SFP 4G/2G/1G Fibre Channel & 1G Ethernet, 850nm, 150-500m, SX	CSFP-4G-8-1
SFP 4G/ 2G/ 1G Fibre Channel & 1G Ethernet, 1310nm, 5km, LX	CSFP-4G-3-1
SFP 4G/2G/1G Fibre Channel & 1G Ethernet, 1310nm, 20km, LX	CSFP-4G-3-2
SFP+ 8G/4G/2G Fibre Channel, 6G/4.9G CPRI 850 nm MM Multirate	CSFP-PLUS-8G-8-1
SFP+ 8G/4G/2G Fibre Channel, 6G/4.9G CPRI 1310nm SM, 10km	CSFP-PLUS-8G-3-1
SFP+ 1G/10G Ethernet, 1G/10G Fiber Channel & 9.8G CPRI, 850nm, MM, 300m	SFPPLUS-1GE-10GE-8-1
SFP+ 1G/10G Ethernet, 1G/10G Fiber Channel & 9.8G CPRI, 1310nm, SM, 10km	SFPPLUS-1GE-10GE-3-1
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 carry- ing 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 four tips	FBP-SD101
KIT: FBP-P5000i digital probe, FiberChekPRO software, case, and seven 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, adapters, and cleaning materials	FIT-SD103-C
KIT: FBP-P5000i digital probe, MP-80A USB power meter, FiberChekPRO software, case, tips, and adapters	FIT-SD113

1. Supplied accessories: User's Guide (Soft copy), USB Memory, Cross LAN Cable, USB Cable, DC car adapter, Li-Ion Battery, AC/DC adapter, Stylus Pen
2. Highly recommended using the Calibration Kit (JD78050509, JD78050510, JD70050509)
3. Highly recommended using the Calibration Kit (JD78050507, JD78050508) and Bias Tee (option 002)
4. Requires option 001
5. Needs for RFoFIBER options 060,061,062,063,064,065,066,068,070,071,072,073,081,082, 083,084,086,091,092,096,101
6. Needs Omni or Yagi antenna
7. Highly recommended adding option 010
8. Includes a Bluetooth USB dongles with 5 dBi dipole antennas (JD70050006)
9. Requires option 013 and option 028 and Needs TrueSite(FTA)
10. Requires option 013 and option 029 and Needs TrueSite(FTA)
11. Includes a Wi-Fi USB dongle (JD70050008)
12. Requires option 020
13. Highly recommended using the RF Directional Coupler (G710050585) or RF combiner (G710050586)
14. Requires option 028
15. Highly recommended using the 4x1 RF combiner (G710050587)
16. Requires option 029
17. Requires option 030
18. Requires option 031
19. Requires option 010
20. Requires G700050380
21. Requires option 008
22. Needs proper SFP/SFP+ Transceiver and Optical Tap or Thur mode fiber cable (G700050401 or G700050402)
23. Requires at least one of RFoCPRI Interference Analyzer options (option 060 to 065), needs each of the respective/corresponding Interference Analyzer line rate
24. Requires option 081
25. Requires option 082
26. Requires at least one of RFoOBSAI Interference Analyzer options (option 070 to 073), needs each of the respective/corresponding Interference Analyzer line rate

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- Maintain your equipment for peak performance at a low, predictable cost.

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*5-year plans only

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BronzeCare	Technician Efficiency	Premium	✓	✓	✓				
SilverCare	Maintenance & Measurement Accuracy	Premium	✓	✓	✓	✓*	✓		
MaxCare	High Availability	Premium	✓	✓	✓	✓*	✓	✓	✓

VIAVI Solutions

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