



# CellAdvisor™

## JD788B Signal Analyzer

### Spectrum Analyzer (standard)

Frequency		
Frequency accuracy	± (Readout frequency x Internal 10MHz Frequency reference accuracy + RBW centering + 2 Hz + 0.5 x Horizontal resolution)	
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 dBc/Hz ( -102 dBc/Hz, typical)	
100 kHz	-105 dBc/Hz ( -112 dBc/Hz, typical)	
1 MHz	-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

### Power Meter: 10 MHz to 8 GHz

### Specification\* Conditions

The JD788B specifications apply under these conditions:

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

Displayed Average Noise Level (DANL)	
1 Hz RBW, 1 Hz VBW, 50 $\Omega$ termination, 0 dB attenuation, RMS detector	
<b>Preamplifier Off</b> 10 MHz to 2.4 GHz >2.4 GHz to 6 GHz >6 GHz to 7 GHz >7 GHz to 8 GHz	-140 dBm ( -145 dBm, typical) -136 dBm ( -140 dBm, typical) -134 dBm ( -138 dBm, typical) -128 dBm ( -134 dBm, typical)
<b>Preamplifier On</b> 10 MHz to 3 GHz >3 GHz to 5 GHz >5 GHz to 7 GHz >7 GHz to 8 GHz	-160 dBm ( -165 dBm, typical) -158 dBm ( -162 dBm, typical) -155 dBm ( -158 dBm, typical) -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, dB $\mu$ V
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	$\pm 1.3$ dB ( $\pm 0.5$ dB typical) Add $\pm 1.0$ dB
	20 to 30°C after 60-minute warm up  -10 to 55°C after 60-minute warm up
Reference Level	
Setting range	-120 to +100 dBm
<b>Setting Resolution</b> Log scale Linear scale	0.1 dB 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 $\mu$ s to 200 s	Span = 0 Hz (zero span)
Accuracy	$\pm 2\%$	Span = 0 Hz (zero span)
Mode	Continuous, single	
Gated Sweep		
Trigger source	External, video, and GPS	
Gate length	1 $\mu$ s to 100 ms	
Gate delay	0 to 100 ms	
Trigger		
Trigger source	Free run, video, external	
<b>Trigger Delay</b> Range Resolution	0 to 200 s 6 $\mu$ s	
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.

## RF PowerMeter(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	$\pm(4\% \text{ of reading} + 0.05 \text{ W})^{1,2}$		
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	$\pm 7\%^1$		

## 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 input	Universal 2.5 and 1.25 mm		
Accuracy	$\pm 5\%$		

1. CW condition at 25°C  $\pm 10^\circ\text{C}$
2. Forward power

## High-Power CW Signal Generator (Option 003)

Frequency	
Frequency range	10 MHz to 5500 MHz
Frequency reference	$< \pm 1 \text{ ppm maximum}$
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	$\pm 1.5 \text{ dB (20 to } 30^\circ\text{C)}$

## GPS Receiver and Antenna (Option 010)

GPS Indicator		
Latitude, longitude, altitude		
High-Frequency Accuracy		
Spectrum, interference, and signal analyzer		
GPS lock	$\pm 25 \text{ ppb}$	
Hold over (for 3 days)	$\pm 50 \text{ ppb (0 to } 50^\circ\text{C)}$	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)
Web-based remote control

## 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		
<b>Phase RMS Accuracy</b>	±1.0 degrees	(0 < Phase RMS < 8)
Residual error	0.7 degrees (typical)	
Phase peak accuracy	±2.0 degrees	(0 < Phase peak < 30)
8 PSK modulation quality		
<b>EVM Accuracy</b>	±1.5%	(2% < EVM < 8%)
Residual error	2.5%	
RF power vs. time	±0.25 symbol	

Measurements					
Option 022					
<b>Channel Power</b>	Peak level at defined range	TSC (Slot 0 to 7)	C/I*	PvsT – Mask	
Channel power	<b>Spurious Emissions</b>	<b>Constellation</b>	EVM RMS*	Frame average power	
Spectral density	Peak frequency at defined range	Burst power	EVM Peak*	Frequency error	
Peak to average power	Peak level at defined range	Modulation type	EVM 95th*	Phase error RMS	
<b>Occupied Bandwidth</b>	<b>Power vs. Time (slot)</b>	Frequency error	<b>Auto Measure</b>	Phase error peak	
Occupied bandwidth	Burst power	Phase error RMS	Channel power	EVM RMS*	
Integrated power	Max/min point	Phase error peak	Occupied bandwidth	EVM Peak*	
Occupied power	<b>Power vs. Time (frame)</b>	I/Q origin offset*	Spectrum emission mask	I/Q origin offset	
<b>Spectrum Emission Mask</b>	Frame average power	TSC	Spurious emission mask	C/I*	
Reference power	Burst power (Slot 0 to 7)	BSIC	Burst power		

Option 042					
<b>Channel/Frequency Scanner</b>	BSIC (NCC, BCC)	SNR, delay	Frame average power	Modulation type	
Channels or frequencies	<b>Multipath Profile</b>	<b>Modulation Analyzer</b>	BSIC, frame no. and time		
Absolute power	(10 strongest)	Frame avg power trend	C/I, frequency error		
Group (traffic, control)	Frame average power	C/I trend	Burst power		

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	Code channel power > -25 dB			
	±1.5 dB absolute power	Code channel power > -25 dB			
CPICH power accuracy	±0.8 dB (typical)				
Measurements					
Option 023					
<b>Channel Power</b>	<b>ACLR</b>	<b>Constellation</b>	Max, avg active power	<b>Codogram</b>	<b>Auto measure</b>
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	<b>RCSI</b>	Occupied bandwidth
Peak to average power		Peak CDE	<b>Relative Code Domain Error</b>		CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH
<b>Occupied Bandwidth</b>	Rel power at defined range	Frequency error	Abs/Rel code power	<b>CDP table</b>	ACLR
Occupied bandwidth	Time offset	Carrier feed-through			Reference power
Integrated power	<b>Multi-ACLR</b>	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
<b>Spectrum Emission Mask</b>	Highest reference power	<b>Code Domain Power</b>		Code, spreading factor	EVM
Reference power	Abs power at defined range	Abs/Rel code power	Channel power	Allocation (channel type)	Peak CDE
Peak level at defined range		Individual code EVM and its constellation		EVM, modulation type	Carrier feed-through
	Rel power at defined range	Channel power	Power bar graph (Abs/Rel/Delta power)	Relative, absolute power	CPICH absolute power
	<b>Spurious Emissions</b>		CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH	CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH	
	Peak frequency at defined range	Power bar graph (Abs/Rel/Delta power) CPICH, P-CCPCH, S-CCPCH, PICH, P-SCH, S-SCH	Avg RCDE QPSK, 16 QAM, 64 QAM		Max inactive power
	Peak level at defined range				
					<b>Power Statistics CCDF</b>
Option 043					
<b>Channel Scanner (up to 6)</b>	<b>Scramble Scanner (up to 6)</b>	<b>Multipath Profile</b>	<b>Code Domain Power</b>	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	Capacity
	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	<b>Route Map</b>
					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	Code channel power >-25 dB			
	±1.5 dB absolute power	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					
<b>Channel Power</b>	<b>ACPR</b>	Peak level at defined range	Channel power	Reference power	Rho
Channel power	Reference power	<b>Constellation</b>	Power bar graph (Abs/Rel)	Code utilization	Frequency error
Spectral density	Abs power at defined range	Pilot power	Pilot, Paging, Sync, Q-Paging	Code, spreading factor	Time offset
Peak to average power	Rel power at defined range	Rho	Max, avg active power	Allocation (channel type)	Carrier feed-through
<b>Occupied Bandwidth</b>	<b>Multi-ACPR</b>	EVM	Max, avg inactive power	Relative, absolute power	Pilot power
Occupied bandwidth	Lowest reference power	Frequency error	PN offset	<b>Auto Measure</b>	Max inactive power
Integrated power	Highest reference power	Time offset	<b>Codogram</b>	Channel power	PN offset
Occupied power	Abs power at defined range	Carrier feed-through	Code utilization	Occupied bandwidth	<b>Power Statistics CCDF</b>
<b>Spectrum Emission Mask</b>	Rel power at defined range	PN offset	<b>RCSI</b>	Spectrum emission mask	
Reference power	<b>Spurious Emissions</b>	<b>Code Domain Power</b>	Pilot, Paging, Sync, Q-Paging	ACPR	
Peak level at defined range	Peak freq at defined range	Abs/Rel code power	<b>CDP Table</b>	Multi-ACPR	
Option 040					
<b>Channel Scanner (up to 6)</b>	Ec/Io, pilot power, delay	PN offset	Peak amplifier capacity		
Frequencies or channels	<b>Multipath Profile</b>	Pilot, Paging, Sync, Q-Paging power	Average amplifier capacity		
Channel power, PN offset	Channel power	Max, avg active power	Code utilization		
Pilot power, Ec/Io	Multipath power	Max, avg inactive power	Peak utilization		
<b>PN Scanner (up to 6)</b>	Ec/Io, delay	Frequency error	Average utilization		
Channel power	<b>Code Domain Power</b>	Time offset, Rho, EVM	<b>Route Map</b>		
Pilot dominance	Abs/Rel code power	Carrier feed-through	Pilot power		
PN offset	Channel power	Amplifier capacity	Ec/Io		

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	Code channel power >-25 dB				
	±1.5 dB absolute power	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						
<b>Channel Power</b>	<b>ACPR</b>	<b>Power vs. Time (idle and active slot)</b>	<b>Constellation (pilot, MAC 64/128, and data)</b>	<b>Code Domain Power (data)</b>	<b>Auto Measure</b>	
Channel power	Reference power				Channel power	
Spectral density Peak to average power	Abs power at defined range	Slot average power	Channel power	Data channel power	Occupied bandwidth	
		On/off ratio	Rho, EVM, peak CDE	Slot average power	Spectrum emission mask	
<b>Occupied Bandwidth</b>	Rel power at defined range	Idle activity	Frequency error	Max, avg active power	ACPR	
		Pilot, MAC, data power	Time offset	Max, avg inactive power	Multi-ACPR	
Integrated power	<b>Multi-ACPR</b>	<b>Constellation (composite 64/128)</b>	Carrier feed-through	PN offset	Pilot, MAC, data power	
Occupied power			Lowest reference power	PN offset	<b>MAC Codogram</b>	On/off ratio
<b>Spectrum Emission Mask</b>	Highest reference power	Channel power	Modulation type*	Code utilization	PvsT mask (idle slot) or PvsT mask (active slot)	
		Reference power	Rho, EVM, Peak CDE	<b>Code Domain Power (pilot and MAC 64/128)</b>	<b>RCSI</b>	Frequency error
Peak level at defined range	Abs power at defined range	Frequency error	Slot, pilot, MAC, data			
	Rel power at defined range	Time offset	Pilot/MAC channel power	<b>MAC CDP Table</b>	Time offset	
		Carrier feed-through	Slot average power	Reference power	Carrier feed-through	
	<b>Spurious Emissions</b>	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	<b>Power Statistics CCDF</b>	
			PN offset			
Option 041						
<b>Channel Scanner (up to 6)</b>	<b>PN Scanner (up to 6)</b>	<b>Multipath Profile</b>	<b>Code Domain Power</b>	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	<b>Route Map</b>	
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		
Time error (Tau)	±0.2 μs (typical)	External trigger		
Spreading factor	Auto (DL, UL), 1, 2, 4, 8, 16			
Measurements				
Option 025				
<b>Channel Power</b>	<b>Spurious Emissions</b>	<b>Timogram</b>	Avg active code power	Multi-ACLR
Channel power	Peak frequency at defined range	<b>Constellation</b>	Max inactive code power	Slot power
Spectral density	Peak level at defined range	Rho	Avg inactive code power	DwPTS power
Peak to average power	<b>Power vs. Time (slot)</b>	EVM RMS, EVM peak	<b>Code Error</b>	UpPTS power
<b>Occupied Bandwidth</b>	Slot power	Peak CDE	Code power and error	On/off slot ratio
Occupied bandwidth	DwPTS power	Frequency error	Individual code EVM and its constellation	Frequency error
Integrated power	UpPTS power	I/Q origin offset	Data format	EVM RMS
Occupied power	On/off slot ratio	Time offset	Slot, DwPTS power	Peak CDE
<b>Spectrum Emission Mask</b>	Slot PAR	<b>Midamble Power</b>	No. of active code	Max inactive power
Reference power	DwPTS code	Slot power	Scramble code	Scramble code
Peak level at defined range	<b>Power vs. Time (frame)</b>	DwPTS power	Max active code power	
<b>ACLR</b>	Slot power (TS [0 to 6], DwPTS, UpPTS)	Midamble power (1 to 16)	Avg active code power	
Reference power	Data power left (TS [0 to 6], DwPTS, UpPTS)	<b>Code Power</b>	Max inactive code power	
Abs power at defined range	Midamble power (TS [0 to 6], DwPTS, UpPTS)	Abs/Rel code power	Avg inactive code power	
Rel power at defined range	Data power right (TS [0 to 6], DwPTS, UpPTS)	Individual code EVM and its constellation	Peak CDE and peak active CDE	
<b>Multi-ACLR</b>	Time offset (TS [0 to 6], DwPTS, UpPTS)	Data format	<b>Auto Measure</b>	
Lowest reference power	<b>Power vs. Time (mask)</b>	Slot power, DwPTS power	Channel power	
Highest reference power	Slot power	No. of active code	Occupied bandwidth	
Abs power at defined range	On/off slot ratio	Scramble code	Spectrum emission mask	
Rel power at defined range	Off power	Max active code power	ACLR	
Option 045				
<b>Sync-DL ID Scanner (32)</b>	<b>Sync-DL ID vs. Tau (up to 6)</b>	Ec/Io, Tau	DwPTS power	DwPTS Power
Scramble code group	ID, power, Ec/Io, Tau	DwPTS power	Pilot dominance	
Ec/Io, Tau	DwPTS power	Pilot dominance	EVM, frequency error	
DwPTS power	Pilot dominance	<b>Sync-DL ID Analyzer</b>	Ec/Io, CINR	
Pilot dominance	<b>Sync-DL ID Multipath</b>	DwPTS power, Ec/Io trend	<b>Route Map</b>	

Longitude, latitude, and satellite in all screens

## 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

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

#### Option 046

<b>Preamble Scanner (up to 6)</b>	<b>Multipath Profile</b>	<b>Preamble Power Trend</b>		<b>Route Map</b>
<b>Total preamble power</b>	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 +20 dBm	
Channel power accuracy	±1.0 dB (typical)	
Supported bandwidths	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz	
Frequency error	±10 Hz + reference-frequency 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	Antenna 2 RS power and EVM**	PDSCH 256QAM EVM
Spectral density	Subframe power		Cell, group, sector ID		Data EVM RMS, peak
Peak to average power	First slot power		<b>Frame</b>	RS, P-SS, S-SS EVM	
<b>Occupied Bandwidth</b>	Second slot power	EVM, relative or absolute power, modulation type	MBSFN*	Antenna 3 RS power and EVM**	RS, P-SS, S-SS power
Occupied bandwidth	Cell ID, I/Q origin offset		Frame summary table (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/	<b>Data Allocation Map</b>	PBCH power
Integrated power	Time offset	Each control channels'	Data* QPSK, PDSCH/	Data allocation vs frame	Subframe power
Occupied power	<b>Constellation</b>	I/Q diagram	Data* 16 QAM, PDSCH/	Resource block power	OFDM power
<b>Spectrum Emission Mask</b>	MBSFN*	Modulation format	Data* 64 QAM, PDSCH	OFDM symbol power	Time error
Reference power	RS TX power	Frequency error	Data* 256QAM)	Data utilization	I/Q origin offset
Peak level at defined range	PDSCH/Data* QPSK EVM	I/Q origin offset	EVM, relative or absolute power, modulation type	Data allocation vs subframe	<b>Carrier Aggregation**</b>
<b>ACLR</b>	PDSCH/Data* 64 QAM EVM	EVM RMS, EVM peak	Frame average power	Resource block power	Component carriers: up to 5
Reference power	PDSCH 256QAM EVM	<b>Subframe</b>		Data utilization	
Abs power at defined range	Data EVM peak	MBSFN*	OFDM symbol power	<b>Auto Measure</b>	Subframe power
Rel power at defined range	Frequency error	Subframe summary table (P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/	Frequency error	Channel power	P-SS, S-SS, PBCH, RS power and EVM
<b>Multi-ACLR</b>	Time error	Data* QPSK, PDSCH/	I/Q origin offset	Occupied bandwidth	PDSCH/Data* QPSK power and EVM
Lowest reference power	<b>Data Channel</b>	Data* 16 QAM, PDSCH/	EVM RMS, peak	Spectrum emission mask	PDSCH/Data* 16 QAM power and EVM
Highest reference power	MBSFN*	Data* 64 QAM, PDSCH	Data EVM RMS, peak	ACLR	
Abs power at defined range	Resource block power	Data* 256QAM)	Cell, group, sector ID	Multi-ACLR	PDSCH/Data* 64 QAM power and EVM
Rel power at defined range	I/Q diagram	EVM, relative or absolute power, modulation type	<b>Time Alignment Error</b>	Spurious emission mask	
Rel power at defined range	RB power	Time alignment error trend	Time alignment error	Frame average power	PDSCH 256QAM EVM
<b>Spurious Emissions</b>	Modulation format	Time alignment error	Frequency error	Time alignment error	Cell ID
Peak frequency at defined range	I/Q origin offset	Subframe power	RS power difference	Frequency error	Frequency error
Peak level at defined range	EVM RMS, EVM peak	OFDM symbol power	Antenna 0 RS power and EVM	MBSFN*	Time alignment error
		Frequency, time error		PDSCH/Data* QPSK EVM	Antenna port
				PDSCH/Data* 16 QAM EVM	<b>Power Statistics CCDF</b>

#### 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		<b>Datagram</b>	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	<b>Control Channel</b>	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 +20 dBm				
Channel power accuracy	±1.0 dB (typical)				
Supported bandwidth	1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz				
Frequency error	±10 Hz + reference-frequency accuracy	99% confidence level			
Residual EVM (RMS)	2.0% (typical)	Data EVM			
Measurements					
Option 029/031/033					
<b>Channel Power</b>	<b>Spurious Emissions</b>	Data EVM peak	<b>Subframe</b>	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	Cell, group, sector ID	Data EVM RMS, peak
Peak to average power	Peak level at defined range	<b>Data Channel</b>	(P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*, PDSCH/Data* QPSK, PDSCH/Data* 16 QAM, PDSCH/Data* 64 QAM, PDSCH 256QAM)	<b>Data Allocation Map</b>	RS, P-SS, S-SS EVM
<b>Occupied Bandwidth</b>	<b>Power vs. Time (frame)</b>	MBSFN*		Data allocation vs frame	RS, P-SS, S-SS power
Occupied bandwidth	Frame average power	Resource block power		Resource block power	PBCH power
Integrated power	Subframe power	I/Q diagram		OFDM symbol power	Subframe power
Occupied power		RB power		Data utilization	OFDM power
<b>Spectrum Emission Mask</b>	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	<b>Carrier Aggregation**</b>
	Time offset	<b>Control Channel</b>	OFDM symbol power	Data utilization	Component carriers: up to 5
<b>ACLR</b>	<b>Power vs. Time (slot)</b>	Control channel summary	Frequency, time error	<b>Auto Measure</b>	
Reference power	Slot average power	(P-SS, S-SS, PBCH, PCFICH, PHICH, PDCCH, RS, MBSFN*)	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	<b>Constellation</b>	EVM, relative or absolute power, modulation type	<b>Time Alignment Error</b>	ACLR	PDSCH/Data* QPSK power and EVM
	MBSFN*		Time alignment error trend	Multi-ACLR	
<b>Multi-ACLR</b>	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
	PDSCH/Data* 64 QAM EVM	I/Q origin offset	Antenna 1 RS power and EVM	Time alignment error	Cell ID
Rel power at defined range	PDSCH 256QAM EVM	EVM RMS, EVM peak	Antenna 2 RS power and EVM**	MBSFN*	Frequency error
				PDSCH/Data* QPSK EVM	Time alignment error
				PDSCH/Data* 16 QAM EVM	Antenna port
					<b>Power Statistics CCDF</b>
Option 049					
<b>Channel Scanner (up to 6)</b>	<b>ID Scanner (up to 6)</b>	<b>Multipath Profile</b>	<b>Control Channel</b>	EVM RMS, phase	<b>Route Map</b>
Frequency or channels	RSRP/RSRQ dominance	Cell, group, sector ID	RS power trend	Frequency error	RSRP
Cell, group, sector ID	S-SS RSSI dominance	Ant 0 RS Ec/Io, delay	Cell, group, sector ID	PMCH subframe power*	RSRQ
Channel power	S-SS Ec/Io dominance	Ant 1 RS Ec/Io, delay	Control channel table	Time alignment error	RS-SINR
RSRP/RSRQ	Cell, group, sector ID	Ant 2 RS Ec/Io**, delay**	(P-SS, S-SS, PBCH, PCFICH, RS 0, RS 1, RS 2**, RS 3**, MBSFN RS*)	Time offset	S-SS RSSI
RS-SINR	RSRP/RSRQ	Ant 3 RS Ec/Io**, delay**		<b>Datagram</b>	P-SS, S-SS power
Antenna port	RS-SINR/S-SS RSSI			Datagram	S-SS Ec/Io
	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.

## 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	dB $\mu$ V/m, dBmV/m, dBV/m, V/m, W/m <sup>2</sup> , dBm/m <sup>2</sup> , dBW/m <sup>2</sup> , A/m, dBA/m, and Watt/cm <sup>2</sup> .	
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, and 065)

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			
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 (step 1)				
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	Sound indicator, AM/FM audio demodulation, interference ID, spectrum recorder
LOS	LOS	LOS SDI			
LOF	LOF	LOF RAI			
SDI	SDI	Optic RX level	dBm	Spectrogram	Collect up to 72 hr of data
RAI	RAI	Protocol version	1 to 10		
Optic RX level	Optic RX level	C and M HDLC rate (kbps)	No HDLC, 240, 480, 960, 1920, 2400	RSSI	Collect up to 72 hr of data
SFP Information	SFP Information			Spectrum replay	X1, x2, x4, x8
Wavelength	Wavelength	C and M Ethernet subchannel number	20 to 63	PIM Detection	
Vendor	Vendor			Single carrier	
Vendor PN	Vendor PN	Alarm Injection		Multi carrier	
Vendor rev	Vendor rev	R-LOS	Single	PIM calculator	
Power level type	Power level type	R-LOF	Single		
Diagnostic byte	Diagnostic byte	Error Injection			
Nominal rate	Nominal rate	Code	Single/rate		
Min rate	Min rate	K30.7	Single/rate		
Max RX level	Max RX level	Error rate	1E-3 to 1E-9		
Max TX level	Max TX level				

## RFoCPRI GSM (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 (step 1)			
Sample Rate		960 KHz			
Mapping		NA=1, S=1, K=4, NC=1			
TX clock		Internal/external/recovered			
Port type		Master/slave			
Measurements					
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	AM/FM audio demodulation	
Vendor	Vendor	C&M Ethernet Subchannel number	20 to 63	Interference ID,	
Vendor PN	Vendor PN			Spectrum recorder	
Vendor rev	Vendor rev	Word Sync Loss Event		Spectrogram	
Power level type	Power level type	Code Violation		RSSI	
Diagnostic byte	Diagnostic byte	K30.7 words		Spectrum replay	
Nominal rate	Nominal rate	Frame Sync Loss Events		<b>PIM Detection</b>	
Min rate	Min rate	<b>Alarm Injection</b>		Single Carrier	
Max RX level	Max RX level	R-LOS	SDI	Multi Carrier	
Max TX level	Max TX level	R-LOF	RAI	PIM Calculator	

## RFoBSAI™ 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 070		
		1536 Mbps (2x)	Option 071		
		3072 Mbps (4x)	Option 072		
		6144 Mbps (8x)	Option 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)			
Video Bandwidth (RBW)		Accuracy	±10% (nominal)		
		1 Hz to 100 KHz			
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: 3MHz for downlink, 5MHz 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	Sound indicator, AM/FM audio demodulation, interference ID, spectrum recorder
LOS	LOS	LOS			
LOF	LOF	LOF			
Code Violation	Code Violation	Optic RX level	dBm	Spectrogram	Collect up to 72 hr of data
K30.7 words	K30.7 words	Optic TX level	dBm		
Optic RX level	Optic RX level	Port Type	Master	RSSI	Collect up to 72 hr of data
Optic TX level	Optic TX level	TX State	State machine	Spectrum replay	x1, x2, x4, x8
Messages Address	Message Address	RX State	State machine	PIM Detection	Single carrier Multi carrier PIM calculator
Message Counter	Message Counter	TX Address	RP3 Address (Hexadecimal)		
<b>SFP Information</b>	<b>SFP Information</b>	RX Address	RP3 Address (Hexadecimal)		
Wavelength	Wavelength	Word Sync Loss Event			
Vendor	Vendor	Code Violation			
Vendor PN	Vendor PN	K30.7 words			
Vendor rev	Vendor rev	Frame Sync Loss Events			
Power level type	Power level type	<b>Alarm Injection</b>			
Diagnostic byte	Diagnostic byte	K30.7	Single		
Nominal rate	Nominal rate	<b>Error Injection</b>			
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 6.1Gbps

## RFoCPRI™ LTE-FDD Signal Generator (Option 081)

General Parameters		
Optical interface	Dual SFP/SFP+ (supports all MSA compliant SFP modules)	
Link 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)	
IQ Sample width	8 – 20 bits	
Mapping method	Packed and Flexible	
Waveform	Off: CW On: LTE-FDD E-TM1.1, E-TM1.2, E-TM2, E-TM3.1, E-TM3.2, E-TM3.3	
Bandwidth	5 MHz, 10MHz, 15MHz, 20MHz	
Sampling Frequency	N x 3.84MHz (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		
<b>Optical Hardware (Option 008)</b>		
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules), One Ethernet port	
<b>CPRI Parameter</b>		
Line coding	8B/10B	
Line rates	614.4 Mbps, 1228.8 Mbps (Option 060) 2457.6 Mbps (Option 061) 3072.0 Mbps (Option 062)	4915.2 Mbps (Option 063) 6144.0 Mbps (Option 064) 9830.4 Mbps (Option 065)
<b>CPRI Parameter</b>		
IQ Sample width	4 – 20 (step 1)	
Mapping method	1 and 3	
Waveform	CW, LTE-TDD 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	
<b>Optical Hardware (Option 008)</b>	
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules)
Max TX	4 carriers / SFP port, Dual port operation is available
<b>CPRI Parameter</b>	
Line coding	8B/10B
Line rates	614.4 Mbps 1228.8 Mbps 2457.6 Mbps 3072.0 Mbps 4915.2 Mbps 6144.0 Mbps 9830.4 Mbps
<b>CPRI Parameter</b>	
IQ Sample width	8 – 20 (step 1)
Waveform mapping	Carrier / TX Container Map Position
Waveform	CW, CW (two tone), LTE-FDD 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-TDD Multi Carrier Signal Generator (Option 084)

General Parameters	
<b>Optical Hardware (Option 008)</b>	
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules)
Max TX	4 carriers / SFP port, Dual port operation is available
<b>CPRI Parameter</b>	
Line coding	8B/10B
Line rates	614.4 Mbps 1228.8 Mbps 2457.6 Mbps 3072.0 Mbps 4915.2 Mbps 6144.0 Mbps 9830.4 Mbps
<b>CPRI Parameter</b>	
IQ Sample width	8 – 20 (step 1)
Waveform mapping	Carrier / TX Container Map Position
Waveform	CW, CW (two tone), LTE-TDD 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

## RFoBSAI™ 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
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#### OBSAI Parameter

Line coding	8B/10B
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Line rates	768 Mbps (Option 070) 1536 Mbps (Option 071)	3072 Mbps (Option 072) 6144 Mbps (Option 073)
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#### CPRI Parameter

RP3 Type	LTE
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RP3 Address	Hexadecimal
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Waveform	CW, LTE-FDD E-TM1.1, E-TM1.2, E-TM2, E-TM3.1, E-TM3.2, E-TM3.3
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Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz
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Sampling Frequency	N x 3.84 MHz (N=2, 4, 6, 8)
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Gain dynamic range	0 to -50 dB
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Frequency error	±10 Hz + ref freq accuracy, 99% confidence level
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Residual EVM (RMS)	0.02% (typical), Data EVM
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## RFoCPRI™ LTE-FDD Analyzer (Option 091)

General Parameters			
<b>Optical Hardware (Option 008)</b>			
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules), One Ethernet port		
<b>CPRI Parameter</b>			
Line coding	8B/10B		
Line rates	614.4 Mbps, 1228.8 Mbps (Option 060) 2457.6 Mbps (Option 061) 3072.0 Mbps (Option 062)	4915.2 Mbps (Option 063) 6144.0 Mbps (Option 064) 9830.4 Mbps (Option 065)	
<b>Resolution Bandwidth (RBW)</b>			
-3 dB bandwidth	100kHz		
Accuracy	±10% (nominal)		
<b>CPRI Parameter</b>			
IQ Sample width	4 – 20 (step 1)		
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		
<b>Measurements: Option 008, 060, 061, 062, 063, 064, and 065</b>			
<b>Channel Power</b>	<b>Constellation</b>	<b>Subframe</b>	<b>Frame</b>
Channel power	MBSFN*	MBSFN*	MBSFN*
Spectral density	RS TX Power	Subframe Summary	Frame Summary
Peak to average power	PDSCH/Data* QPSK EVM	EVM, Abs. and Rel. Power	EVM, Abs. and Rel. Power
<b>Occupied bandwidth</b>	PDSCH/Data* 16QAM EVM	Subframe Power	Frame Average Power
Occupied Bandwidth	PDSCH/Data* 64QAM EVM	OFDM Symbol Power	OFDM Symbol Power
Integrated Power	Data EVM RMS, Peak	Frequency Error	Frequency Error
Occupied power	Frequency error	Time Error	IQ Origin Offset
<b>Power vs. Time (Frame)</b>	Time Error	Data EVM RMS, Peak	Data EVM RMS, Peak
Frame average power	<b>Control Channel</b>	RS EVM RMS, Peak	Control EVM RMS, Peak
Subframe power	Control Channel Summary	Cell, Group, Sector ID	Cell, Group, Sector ID
First Slot power	EVM, Rel or Abs power of each control channel	<b>Time Alignment Error</b>	<b>Data Allocation Map</b>
Second Slot power		Time alignment error trend	Data Allocation vs. Frame
Cell ID, I/Q origin offset	IQ Diagram	Time alignment error	Resource Block Power
Time offset	Modulation format	RS power difference	OFDM Symbol Power
<b>Power Statistics CCDF</b>	Frequency Error	Antenna 0 RS power, EVM	Data Utilization
Average Power	I/Q origin offset	Antenna 1 RS power, EVM	Data Allocation vs Subframe
Peak Power Crest Factor	Control EVM RMS, Peak	Antenna 2 RS power, EVM **	Resource block power
	<b>Data Channel</b>	Antenna 3 RS power, EVM **	Data Utilization
	MBSFN*	Cell, Group, Sector ID	
	Resource block power		
	I/Q diagram		
	RB power		
	Modulation format		
	I/Q origin offset		
	EVM RMS, Peak		

\* Longitude, latitude, and satellite in all screens

## RFoCPRI™ LTE-TDD Analyzer (Option 092)

### General Parameters

#### Optical Hardware (Option 008)

Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules), One Ethernet port
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#### CPRI Parameter

Line coding	8B/10B	
Line rates	614.4 Mbps, 1228.8 Mbps (Option 060) 2457.6 Mbps (Option 061) 3072.0 Mbps (Option 062)	4915.2 Mbps (Option 063) 6144.0 Mbps (Option 064) 9830.4 Mbps (Option 065)

#### Resolution Bandwidth (RBW)

-3 dB bandwidth	100kHz
Accuracy	±10% (nominal)

#### CPRI Parameter

IQ Sample width	4 – 20 (step 1)
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	Subframe	Data Allocation Map
Channel power	MBSFN*	MBSFN*	Data Allocation vs. Frame
Spectral density	RS TX Power	Subframe Summary	Resource Block Power
Peak to average power	PDSCH/Data* QPSK EVM	EVM, Abs. and Rel. Power	OFDM Symbol Power
<b>Occupied bandwidth</b>	PDSCH/Data* 16QAM EVM	Subframe Power	Data Utilization
Occupied Bandwidth	PDSCH/Data* 64QAM EVM	OFDM Symbol Power	Data Allocation vs Subframe
Integrated Power	Data EVM RMS, Peak	Frequency Error	Resource block power
Occupied power	Frequency error	Time Error	Data Utilization
<b>Power vs. Time (Frame)</b>	Time Error	Data EVM RMS, Peak	<b>Power Statistics CCDF</b>
Frame average power	<b>Control Channel</b>	RS EVM RMS, Peak	Average Power
Subframe power	Control Channel Summary	Cell, Group, Sector ID	Peak Power Crest Factor
First Slot power	EVM, Rel or Abs power of each control channel	<b>Time Alignment Error</b>	
Second Slot power		Time alignment error trend	
Cell ID, I/Q origin offset	IQ Diagram	Time alignment error	
Time offset	Modulation format	RS power difference	
<b>Power vs. Time (Slot)</b>	Frequency Error	Antenna 0 RS power, EVM	
Slot average power	I/Q origin offset	Antenna 1 RS power, EVM	
Transient period length	Control EVM RMS, Peak	Antenna 2 RS power, EVM **	
Off power	<b>Data Channel</b>	Antenna 3 RS power, EVM **	
	MBSFN*	Cell, Group, Sector ID	
	Resource block power		
	I/Q diagram		
	RB power		
	Modulation format		
	I/Q origin offset		
	EVM RMS, Peak		

\* Longitude, latitude, and satellite in all screens

## RFoOBSAI™ LTE-FDD Analyzer (Option 096)

General Parameters			
<b>Optical Hardware (Option 008)</b>			
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules), One Ethernet port		
<b>CPRI Parameter</b>			
Line coding	8B/10B		
Line rates	768 Mbps (Option 070) 1536 Mbps (Option 071)	3072 Mbps (Option 072) 6144 Mbps (Option 073)	
<b>Resolution Bandwidth (RBW)</b>			
-3 dB bandwidth	100kHz		
Accuracy	±10% (nominal)		
<b>OBSAI Parameter</b>			
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			
Channel Power	Constellation	Subframe	Frame
Channel power	MBSFN*	MBSFN*	MBSFN*
Spectral density	RS TX Power	Subframe Summary	Frame Summary
Peak to average power	PDSCH/Data* QPSK EVM	EVM, Abs. and Rel. Power	EVM, Abs. and Rel. Power
<b>Occupied bandwidth</b>	PDSCH/Data* 16QAM EVM	Subframe Power	Frame Average Power
Occupied Bandwidth	PDSCH/Data* 64QAM EVM	OFDM Symbol Power	OFDM Symbol Power
Integrated Power	Data EVM RMS, Peak	Frequency Error	Frequency Error
Occupied power	Frequency error	Time Error	IQ Origin Offset
<b>Power vs. Time (Frame)</b>	Time Error	Data EVM RMS, Peak	Data EVM RMS, Peak
Frame average power	<b>Control Channel</b>	RS EVM RMS, Peak	Control EVM RMS, Peak
Subframe power	Control Channel Summary	Cell, Group, Sector ID	Cell, Group, Sector ID
First Slot power	EVM, Rel or Abs power of each control channel	<b>Time Alignment Error</b>	<b>Data Allocation Map</b>
Second Slot power		Time alignment error trend	Data Allocation vs. Frame
Cell ID, I/Q origin offset	IQ Diagram	Time alignment error	Resource Block Power
Time offset	Modulation format	RS power difference	OFDM Symbol Power
<b>Power Statistics CCDF</b>	Frequency Error	Antenna 0 RS power, EVM	Data Utilization
Average Power	I/Q origin offset	Antenna 1 RS power, EVM	Data Allocation vs Subframe
Peak Power Crest Factor	Control EVM RMS, Peak	Antenna 2 RS power, EVM **	Resource block power
	<b>Data Channel</b>	Antenna 3 RS power, EVM **	Data Utilization
	MBSFN*	Cell, Group, Sector ID	
	Resource block power		
	I/Q diagram		
	RB power		
	Modulation format		
	I/Q origin offset		
	EVM RMS, Peak		

\* Longitude, latitude, and satellite in all screens

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

General Parameters			
<b>Optical Hardware (Option 008)</b>			
Interface	Two SFP/SFP+ ports (supports all MSA compliant SFP modules), One Ethernet port		
<b>CPRI Parameter</b>			
Line coding	8B/10B		
Line rates	614.4 Mbps, 1228.8 Mbps (Option 060) 2457.6 Mbps (Option 061) 3072.0 Mbps (Option 062)	4915.2 Mbps (Option 063) 6144.0 Mbps (Option 064) 9830.4 Mbps (Option 065)	
<b>Resolution Bandwidth (RBW)</b>			
-3 dB bandwidth	1 kHz to 10 kHz (span ≤ 3.84 MHz) 1 KHz to 100 kHz (3.84 MHz < span ≤ 30.86 MHz)		
Accuracy	±10% (nominal)		
<b>CPRI Parameter</b>			
IQ Sample width	4 – 20 (step 1)		
Mapping method	1 and 3		
TX clock	Internal/External		
Port type	Master		
Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz		
Span	Adjustable (Max Span= Sampling Frequency)		
<b>Measurements</b>			
<b>Carrier Configuration</b>	<b>SFP Information</b>	<b>Spectrum Clearance</b>	<b>Coverage Range</b>
RRH Description	RRH Description	Spectrum	Spectrum
Carrier Information	SFP Information	Spectrogram	Carrier Information
<b>CPRI &amp; Active SW</b>	<b>Profile Editor</b>	RSSI	VSWR
RRH Description		Dual Spectrum	Tilt
CPRI State		Dual Active Trace	<b>PIM Analysis</b>
Active SW		Dual Spectrogram	Single Radio
			Spectrum
			Flatness

## General Information

Frequency		
<b>RF in</b>	Spectrum analyzer	
Connector	Type-N, female	
Impedance	50 $\Omega$ (nominal)	
Damage level	>+33 dBm, $\pm$ 50 V DC (nominal), 3 min	
<b>RF out</b>		
Connector	Type-N, female	
Impedance	50 $\Omega$ (nominal)	
Damage level	>+40 dBm, $\pm$ 50 V DC (nominal), 3 min	
<b>External trigger, GPS</b>		
Connector	SMA, female	
Impedance	50 $\Omega$ (nominal)	
<b>External ref</b>		
Connector	SMA, female	
Impedance	50 $\Omega$ (nominal)	
Input frequency	10 MHz, 13 MHz, 15 MHz	
Input range	-5 to +5 dBm	
<b>USB</b>		
USB host <sup>1</sup>	Type A, 1 port	
USB client <sup>2</sup>	Type B, 1 port	
<b>SFP Cage</b>		
Port 1	RFoFiber (with option 008)	
Port 2	SFP/SFP+ compatible	
LAN <sup>3</sup>	RJ45, 10/100Base-T	
Audio jack	3.5 mm headphone jack	
External power	5.5 mm barrel connector	
Speaker	Built-in speaker	
<b>Display</b>		
Type	Resistive touch screen	
Size	8 inch, LED backlight, transfective LCD with anti-glare coating	
<b>Power</b>		
External DC input	18 to 19 V DC	
Power consumption	42 W	49 W maximum (when charging battery)
<b>Battery</b>		
Type	10.8 V, 7800 mA/hr (lithium ion)	
Operating time	>3 hr (typical) >1.4 hr (RFoCPRI)	
Charge time	3 hr (while not operating) 9 hr (while operating)	
Charging temperature	0 to 45°C (32 to 104°F) $\leq$ 85% RH	
Discharging temperature	-20 to 55°C (4 to 131°F) $\leq$ 85% RH	
Storage temperature <sup>3</sup>	0 to 25°C (32 to 77°F)	

Data Storage	
Internal	Maximum 512 MB
External <sup>5</sup>	Limited by size of USB flash drive
<b>Environmental</b>	
<b>Operating Temperature</b>	
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 -10 to 50°C (14 to 122°F) at discharging with RFoCPRI
Maximum humidity	95% RH (noncondensing)
Shock and vibration	MIL-PRF-28800F class 2
Storage temperature <sup>6</sup>	-30 to 71°C (-22 to 160°F)
<b>EMC</b>	
IEC/EN 61326-1:2006 (complies with European EMC)	
CISPR11:2009 +A1:2010	
<b>ESD</b>	
IEC/EN 61000-4-2	
<b>Size and Weight (standard configuration)</b>	
Weight (with battery)	<4.0 kg (8.8 lb)
Size (W x H x D)	295 x 195 x 82 mm
<b>Warranty</b>	
3 years	
<b>Calibration Cycle</b>	
1 year	

1. Connects flash drive, power sensor, EZ-Cal kit, and fiber microscope.
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. Supports USB 2.0 compatible memory devices.
6. With the battery pack removed.

## Ordering Information

Description	Part Number
<b>Standard CellAdvisor RF Analyzer</b>	
RF analyzer includes: Spectrum analyzer 9 kHz to 8 GHz RF power meter 10 MHz to 8 GHz	JD788B <sup>1</sup>
<b>Options</b> NOTE: Upgrade options for the JD788B use the designation JD788BU before the respective last three-digit option number	
2 Port transmission measurements for JD788B <sup>2</sup>	JD788B001
CW signal generator for JD788B <sup>2</sup>	JD788B003
Signal Generator hardware for JD788B <sup>3</sup>	JD788B007
Optical hardware for JD788B <sup>4</sup>	JD788B008
20 MHz demodulation hardware for JD788B <sup>5</sup>	JD788B009
GPS receiver and antenna for JD788B	JD788B010
Interference analyzer for JD788B <sup>6,7</sup>	JD788B011
Channel scanner for JD788B	JD788B012
Bluetooth connectivity for JD788B <sup>8</sup>	JD788B013
LTE-FDD RAN performance indicator for JD788B <sup>9,10</sup>	JD788B014
LTE-TDD RAN performance indicator for JD788B <sup>10,11</sup>	JD788B015
Wi-Fi connectivity for JD788B <sup>12</sup>	JD788B016
cdmaOne/cdma2000 analyzer for JD788B <sup>10</sup>	JD788B020
EV-DO analyzer for JD788B <sup>10,13</sup>	JD788B021
GSM/GPRS/EDGE analyzer for JD788B <sup>10</sup>	JD788B022
WCDMA/HSPA+ analyzer for JD788B <sup>10</sup>	JD788B023
TD-SCDMA analyzer for JD788B <sup>10</sup>	JD788B025
Mobile WiMAX analyzer for JD788B <sup>10</sup>	JD788B026
LTE - FDD analyzer for JD788B <sup>10,14</sup>	JD788B028
LTE - TDD analyzer for JD788B <sup>10,14</sup>	JD788B029
LTE Advanced - FDD analyzer for JD788B <sup>10,15,16</sup>	JD788B030
LTE Advanced - TDD analyzer for JD788B <sup>10,16,17</sup>	JD788B031
LTE-FDD 256 QAM Demodulator for JD788B <sup>10,18</sup>	JD788B032
LTE-TDD 256 QAM Demodulator for JD788B <sup>10,19</sup>	JD788B033
cdmaOne/cdma2000 OTA analyzer for JD788B <sup>10,20</sup>	JD788B040
EV-DO OTA analyzer for JD788B <sup>10,20</sup>	JD788B041
GSM/GPRS/EDGE OTA analyzer for JD788B <sup>10,20</sup>	JD788B042
WCDMA/HSPA+ OTA analyzer for JD788B <sup>10,20</sup>	JD788B043
TD-SCDMA OTA analyzer for JD788B <sup>10,20</sup>	JD788B045
Mobile WiMAX OTA analyzer for JD788B <sup>10,20</sup>	JD788B046
LTE - FDD OTA analyzer for JD788B <sup>10,20</sup>	JD788B048
LTE - TDD OTA analyzer for JD788B <sup>10,20</sup>	JD788B049
EMF analyzer for JD788B <sup>21</sup>	JD788B050
RFoCPRI 614M & 1.2G interference analyzer for JD788B <sup>22,23</sup>	JD788B060
RFoCPRI 2.4G interference analyzer for JD788B <sup>22,23</sup>	JD788B061
RFoCPRI 3.1G interference analyzer for JD788B <sup>22,23</sup>	JD788B062
RFoCPRI 4.9G interference analyzer for JD788B <sup>22,23</sup>	JD788B063
RFoCPRI 6.1G interference analyzer for JD788B <sup>22,23</sup>	JD788B064
RFoCPRI 9.8G interference analyzer for JD788B <sup>22,23</sup>	JD788B065
RFoCPRI GSM interference analyzer for JD788B <sup>21,22,23</sup>	JD788B068
RFoBSAI 768M Interference analyzer for JD788B <sup>22,23</sup>	JD788B070
RFoBSAI 1.5G interference analyzer for JD788B <sup>22,23</sup>	JD788B071

Description	Part Number
RFoBSAI 3.1G interference analyzer for JD788B <sup>22,23</sup>	JD788B072
RFoBSAI 6.1G interference analyzer for JD788B <sup>22,23</sup>	JD788B073
RFoCPRI LTE-FDD signal generator for JD788B <sup>22,23,24</sup>	JD788B081
RFoCPRI LTE-TDD signal generator for JD788B <sup>22,23,24</sup>	JD788B082
RFoCPRI LTE-FDD multi carrier signal generator for JD788B <sup>22,23,25</sup>	JD788B083
RFoCPRI LTE-TDD multi carrier signal generator for JD788B <sup>22,23,26</sup>	JD788B084
RFoBSAI LTE-FDD signal generator for JD788B <sup>2,23,27</sup>	JD788B086
RFoCPRI LTE-FDD signal analyzer for JD788B <sup>22,23,24</sup>	JD788B091
RFoCPRI LTE-TDD signal analyzer for JD788B <sup>22,23,24</sup>	JD788B092
RFoBSAI LTE-FDD signal analyzer for JD788B <sup>22,23,27</sup>	JD788B096
ALU BBU emulation for JD788B <sup>22,23</sup>	JD788B101
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
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
LTE-FDD 256 QAM Demodulator floating license for JD740B/JD780B	JD780B032-FL
LTE-TDD 256 QAM Demodulator floating license for JD740B/JD780B	JD780B033-FL

## Ordering Information (Continued)

Description	Part Number
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
RFoBSAI 768M interference analyzer floating license for JD740B/JD780B	JD780B070-FL
RFoBSAI 1.5G interference analyzer floating license for JD740B/JD780B	JD780B071-FL
RFoBSAI 3.1G interference analyzer floating license for JD740B/JD780B	JD780B072-FL
RFoBSAI 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
RFoBSAI 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
RFoBSAI LTE-FDD signal analyzer floating license for JD740B/JD780B	JD780B096-FL
ALU BBU emulation floating license for JD740B/JD780B	JD780B101-FL

Description	Part Number
<b>Optional Accessories</b>	
<b>Accessory - RF Cables (Cables)</b>	
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
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
RF cable DC to 18 GHz Type-N(m) to Type-N(f), 1.5 m	G710050531
<b>Accessory - Optic Cables (Cables)</b>	
SM/LC T-Jumper and 1.5 m fiber cable	G700050401
MM/LC T-Jumper and 1.5 m fiber cable	G700050402
<b>Accessory - RF Antennas (General)</b>	
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 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), 700 to 4000 MHz, 1.85 dBd	G700050366
RF yagi antenna SMA(f), 700 to 6000 MHz, 2.85 dBd	G700050367
Isotropic Antenna Type-N(m), 26 MHz to 3 GHz	G700050380
<b>Accessory - RF Power Sensor (General)</b>	
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
<b>Accessory - RF Adapters (Connector &amp; Adapters)</b>	
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 to 7.5 GHz, 50 ohm	G700050576

## Ordering Information (Continued)

Description	Part Number
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
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 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
<b>Accessory - RF Miscellaneous (General)</b>	
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)30	G710050585
RF combiner, 700 to 4000 MHz, Type-N(f) to Type-N(m) 30	G710050586
4x1 RF combiner, 700 to 4000 MHz, Type-N(f) to Type-N(m) 31	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
<b>Accessory - General</b>	
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
> 1GB USB memory	GC72450518
Stylus pen	G710550316
<b>Accessory - Battery &amp; Chargers</b>	
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

Description	Part Number
<b>Accessory - Manual &amp; Documentation</b>	
JD700B series user's guide - printed version	JD700B362
<b>Accessory - Carrying Case</b>	
Soft carrying case	JD74050341
Hard carrying Case	JD71050342
Hard carrying case with wheels	JD70050342
CellAdvisor backpack carrying case	JD70050343
<b>Optional TAP</b>	
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
<b>Optional SFP Transceiver</b>	
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	CSFPPLUS-8G-8-1
SFP+ 8G/4G/2G Fibre Channel, 6G/4.9G CPRI 1310nm SM, 10km	CSFPPLUS-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
<b>Optical Power Meters and Fiber Microscope Kits</b>	
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 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, USB Memory (1GB), Cross LAN Cable, USB Cable, DC car adapter, Li-Ion Battery, AC/DC adapter, Stylus Pen
2. Requires option 007
3. Needs options 001 or 003
4. Needs for RFoFIBER options 060,061,062,063,064,065,068,070,071,072,073,081,082,083,084,091,092,096,101
5. Needs options 020, 021, 022, 023, 025, 026, 028, 029, 030, 031, 032, 033, 040, 041, 042, 043, 045, 046, 048, 049
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 009
11. Requires option 013 and option 029 and Needs TrueSite(FTA)
12. Includes a Wi-Fi USB dongle (JD70050008)
13. Requires option 020
14. Highly recommended using the RF Directional Coupler (G710050585) or RF combiner (G710050586)
15. Requires option 028
16. Highly recommended using the 4x1 RF combiner (G710050587)
17. Requires option 029
18. Requires option 030
19. Requires option 031
20. Requires option 010
21. Requires G700050380
22. Requires option 008, Including Layer2 Term and Monitoring
23. Needs proper SFP/SFP+ Transceiver and Optical Tap or Thru mode fiber cable (G700050401 or G700050402)
24. Requires at least one of RFoCPRI Interference Analyzer options (option 060 to 065), needs each of the respective/corresponding Interference Analyzer line rate
25. Requires option 081
26. Requires option 082
27. Requires at least one of RFoBSAI Interference Analyzer options (option 070 to 073), needs each of the respective/corresponding Interference Analyzer line rate



Contact Us **+1 844 GO VIAVI**  
(+1 844 468 4284)

To reach the Viavi office nearest you,  
visit [viasolutions.com/contacts](http://viasolutions.com/contacts).



Emitec Messtechnik AG  
Birkenstrasse 47  
6343 Rotkreuz

+41 41 748 60 10  
info@emitec.ch  
[www.emitec-industrial.ch](http://www.emitec-industrial.ch)



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