VIAVI Solutions

Data Sheet

VIAVI
CX700 ComXpert Radio Test System

General Specifications

RF Generator	
Frequency	
Range	100 kHz to 3 GHz (CX700) 3 GHz to 6 GHz (CX700-F6GHZ)
Accuracy	Same as timebase
Resolution	0.1 Hz
Output Level	
RF Duplex Port Range	-130 dBm to -30 dBm (>1 MHz) -140 dBm to -30 dBm (>10 MHz) -130 dBm to -30 dBm (>1 GHz)
RF Output Port Range	-120 dBm to +17 dBm (>1 MHz) -130 dBm to +17 dBm (>10 MHz) -120 dBm to +17 dBm (>1 GHz)
RF Duplex Port Accuracy	±1 dB (>1 MHz)
RF Output Port Accuracy	±1 dB (> -120dBm) ±2 dB (< -120dBm) ±1 dB typical
Resolution	0.1 dB
Maximum Bandwidth	100 MHz IBW
VSWR	
RF Duplex Port	≤1.1 (1 MHz to 1 GHz); <1.2 (1 GHz to 6 GHz)
RF Output Port	≤1.4 (1 MHz to 1 GHz); <1.5 (1 GHz to 6 GHz)
Spectral Purity	
Phase Noise	-112 dBc/Hz at 10 kHz offset at 500 MHz
RF Output Port Harmonics	-35 dBc for output level <+10 dBm
RF Duplex Port Harmonics	-35 dBc for output level <-30 dBm
Non-Harmonics	<-50 dBc (<2.8 GHz) <-45 dBc (>2.8 GHz)
Residual AM	<0.1% rms
Residual FM	<3 Hz rms 300 Hz to 3 kHz for frequency < 1GHz
I/Q File	
Modulation Capability	Allows user to "RUN" arbitrary waveforms as modulation source Browse and load I/Q file

Analog Modulation	
Modulation	
Modes	AM, FM, PM, SSB
Distortion	<0.7% (700 Hz to 1.1 kHz) <1% (20 Hz to 20 kHz)
FM	
Range	Off, 0 to ± 100 kHz
Accuracy	< ±2.5% of setting
Rate	20 Hz to 20 kHz, useable to 100 kHz
Resolution	1 Hz
Waveform	Sine, Square, Triangle, Ramp
AM	
Range	0% to 100%
Accuracy	< ±5% of setting
Rate	20 Hz to 20 kHz, useable to 100 kHz
Resolution	0.1%
Waveform	Sine, Square, Triangle, Ramp
PM	
Range	Off, 0 radians to 6.3 radians
Accuracy	±2.5% of setting
Rate	20 Hz to 20 kHz, useable to 100 kHz
Resolution	0.1 mradians
Waveform	Sine, Square, Triangle, Ramp
SSB	
Range	300 Hz to 3 kHz
Carrier suppression	>70 dB
Sideband suppression	>60 dB
Internal Modulation Sources	
Number of sources	3
Sources	
Waveforms	Sine, Square, Triangle, Ramp
Sine Wave	
Range	DC to 100 kHz
Resolution	0.1 Hz

AM Distortion	30% to 70% modulation < 1% (700 Hz to 1.1 kHz) < 1.5% (100 Hz to 6.0 kHz) < 2.5% (> 6.0 kHz to 10.0 kHz)
FM Distortion	< 0.7%,(700 Hz to 1.1 kHz) < 1% (20 Hz to 20 kHz)
PM Distortion	< 2% (1 kHz rate, ≥ 0.3 radians)
Square Wave	
Range	20 Hz to 20 kHz
RF Receiver	
Frequency	
Range	9 kHz to 3 GHz (CX700) 3 GHz to 6 GHz (CX700-F6GHZ)
Accuracy	Same as timebase
Resolution	1 Hz
Maximum Input Level	
RF Input Port	+20 dBm max preamp off and frequency >1 MHz
RF Duplex Port	50 W continuous at 50°C ambient 50-150W, 30s on, 2min off at 50°C ambient 150-200W, 15s on, 2min off at 50°C ambient
VSWR	
RF Duplex Port	≤1:1:1 typical for frequency ≤1 GHz ≤1:2:1 typical for frequency >1 GHz
RF Input	≤1.6:1 for frequency ≤1 GHz with 10 dB of input attenuation ≤2:4:1 typical for frequency >1 GHz
Harmonic Response	
Spurious Response	Input related ≤-65 dBc typical Non-input related ≤-95 dBm typical
Phase Noise	-112 dBc/Hz at 10 kHz offset at 500 MHz -110 dBc/Hz at 10 kHz offset at 1000 MHz
Dynamic Range	2/3 * (TOI-DANL) = 109 dB
TOI	+20 dBm (0 atten), >+1 dBm (preamp), 1 MHz to 1 GHz
DANL	1 Hz RBW @ 1 GHz; <-144 dBm (0 atten), <-162 dBm (preamp)
Bandwidth	
Analog Bandwidth	100 MHz (wideband VSA), 8 MHz (narrowband)
IF Bandwidth	5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz, 100 kHz, 300 kHz
Analog Demodulation Measurements	
FM	
Deviation Range	0 Hz to 100 kHz
Modulation Rate Range	10 Hz to 40 kHz, useable to 100 kHz
Accuracy	±2.0%, ±1.0% (rate 1.5 kHz to 3 kHz)
Resolution	0.1 Hz
Modes	RMS, RMS*√2, +PK, -PK, ±PK/2
FM Distortion	±0.5% for rate ≤3 kHz ±1.0% otherwise
Residual FM	≤3 Hz (300 Hz to 3 kHz) and frequency <1 GHz
AM	
Depth	0% to 100%
Modulation Rate Range	10 Hz to 20 kHz
Accuracy	±2.0%, ±1.0% (rate 1.5 kHz to 3 kHz)
Modes	RMS, RMS*√2, +PK, -PK, ±PK/2
AM Distortion	±0.5% for rate ≤3 kHz ±1.0% otherwise
Residual AM	<0.1% (300 Hz to 3 kHz)
PM	
Range	0 radians to 10 radians
Rate	10 Hz to 20 kHz
Accuracy	±2.0%, ±1.0% (rate 1.5 kHz to 3 kHz)
Resolution	0.01 rad for ≤ 5 rad 0.1 rad for > 5 rad
SSB	
Modes	SSB-USB, SSB-LSB
Measurement Range	Frequency error, Power (RMS), Power (PEP)
Audio Frequency Generators	
Output	
Output Ports	AF Output
Impedance	<4 Ω
Max Output Current	100 mA
Frequency	
Range	DC to 100 kHz (sine only)
Resolution	0.1 Hz
Accuracy	Same as timebase
Level	
Range	0 to ±4V pk into 50 Ohms 0 to ±7V pk into 150 Ohms 0 to ±8V pk into 600 Ohms
Accuracy	AC: ±2 % (level >200 mV and frequency from 20 Hz to 20 kHz) AC: ±5 % (level <2 mV and frequency from 20 Hz to 100 kHz) DC: 1% (level >200 mV) 2% otherwise
Waveforms	Sine, Square, Triangle, Ramp
Distortion	
THD+N	<-75 dB for frequency 1 kHz and level 1 Vrms
Audio Input	
Frequency	DC to 100 kHz
Input Impedance	150 Ω (UUT-A), 300 Ω, 600 Ω, 100 kΩ single ended, ±1 % shunted by ≤ 300 pF, 200 kΩ differential, ±8 % max input voltage 30 VRMS max input power 1.5 W
Level	
Range	50 mVrms to 30 Vrms
Accuracy	±5% (Audio) ±1% (DC)
Audio Analyzer	
Frequency Resolution	0.8 Hz to 2.4 Hz RBW
FFT Windows	Flat top, rectangular, Hamming, Hann, Blackman-Harris
Power Meter	
Frequency	
Range	100 kHz to 3 GHz (CX700) 3 GHz to 6 GHz (CX700-F6GHZ)
Measurement Modes	RMS, average RMS, minimum, maximum
Bandwidth	5 kHz, 6.25 kHz, 8.33 kHz, 10 kHz, 12.5 kHz, 25 kHz, 30 kHz, 100 kHz, and 300 kHz

Input Range	
RF Duplex Port	-20 dBm to +53 dBm
RF Input Port	-60 dBm to +10 dBm
Resolution	1% or 0.1 mW
Accuracy	
RF Duplex Port	>0.02 mW level, ± 10% ±0.4 dB (frequency <1 GHz & >1 MHz), ±0.5 dB (elsewhere)
RF Input Port	>-80 dBm, ±0.6 dB (frequency <1 GHz & >1 MHz), ±0.9 dB (elsewhere)
Units	Watts, mWatts, and dBm (absolute and relative)
Burst Power Meter	
Frequency Range	100 kHz to 3 GHz (CX700) 3 GHz to 6 GHz (CX700-F6GHZ)
Input Range	1 to 100%
Resolution	0.10%
Accuracy	±0.2% Power Envelope Drop Out, 10 - 90% duty cycle, 1 Hz to 10kHz, <20% drop out
RF Error Meter	
Frequency	
Range	100 kHz to 3 GHz (CX700) 3 GHz to 6 GHz (CX700-F6GHZ)
Meter Range	0 Hz to ± 100.0 kHz (in 4 decade ranges)
Resolution	1 Hz
Accuracy	Same as timebase, ±1 count
Input Level Range	
RF Duplex Port	-20 to 51 dBm
RF Input Port	-60 to +17 dBm (-80 to -20 dBm w/pre-amp)
Audio and Demodulation Meters	
AF Counter Meter	
Frequency Range	DC to 100 kHz
Accuracy	Same as timebase, ± 0.1 Hz
Resolution	0.1 Hz
Meter Source	Audio 1 Input, DEMOD
AF Level Meter	
Input Level Range	20 mVrms to 30 Vrms for Hi-Z / 600 Ω Impedance 20 mVrms to 7 Vrms for 150 Ω / 300 Ω Impedance
Resolution	1 mV
Frequency Range	DC to 100 kHz
Accuracy	±2% of reading (200 mV to 2 V, 20 Hz to 20 kHz), ±5% (200 mV to 200 V, 20 Hz to 100 kHz)
SINAD Meter	
Measurement Range	0 dB to 63 dB
Accuracy	±1 dB ±1 count
Resolution	0.01 dB
Frequency Range	50 Hz to 10 kHz
Distortion Meter	
Measurement Range	0% to 100%
Accuracy	±3% of reading + 0.1% distortion for 1% to 20%
Frequency Range	50 Hz to 10 kHz

S/N Meter	
Frequency Range	50 Hz to 10 kHz
Measurement Range	0 to 63 dB
Accuracy	<1 dB
Error Vector Magnitude	
Frequency Range	100 kHz to 3 GHz (CX700) 3 GHz to 6 GHz (CX700-F6GHZ)
Range	0 - 100%
Resolution	0.01%
Input level	RF Duplex Port: > -20 dBm RF Input Port: > -60 dBm
8PSK Modulation Accuracy	±0.4% for 2% < x < 20%, for measurement length > 150 symbols
8PSK Modulation Residual	residual (floor) < 1.5% rms for frequency 1GHz and IBW 10MHz
4QAM Modulation Accuracy	±0.3% for 2% < x < 20%, for measurement length > 150 symbols
4QAM Modulation Residual	residual (floor) < 1.5% rms for frequency 1GHz and IBW 10MHz
16QAM Modulation Accuracy	±0.3% for 2% < x < 20%, for measurement length > 150 symbols
16QAM Modulation Residual	residual (floor) < 1.2% rms for frequency 1GHz and IBW 10MHz
FSK Meter	
Frequency Range	100 kHz to 3 GHz (CX700) 3 GHz to 6 GHz (CX700-F6GHZ)
Range	1 kHz - 10 kHz
Resolution	0.01 Hz
Input level	RF Duplex Port: > -20 dBm RF Input Port: > -60 dBm
Accuracy	±25Hz
Modulation Fidelity Range	0 - 30%
Modulation Fidelity Resolution	0.01%
Mod Fidelity Accuracy	0.30%
Mod Fidelity Residual	residual (floor) < 0.6% rms for frequency 1GHz and IBW 10MHz, h =0.75 (h is 2PI*freq deviation / freq symb)
Audio Filters	
Lowpass	300 Hz, 3 kHz, 3.4 kHz, 5 kHz, 15 kHz, 20 kHz
Highpass	20 Hz, 50 Hz, 300 Hz
Other	C-MSG, CCITT, A-Weighted, C-Weighted
De-emphasis	75 µs, 750 µs
FFT / Channel Analyzer	
Span	2 kHz to 8 MHz
IF Bandwidth	10 MHz
RBW	1 Hz to 50 kHz
Detector	Normal, positive peak, negative peak, sample, average (RMS)
Accuracy	RF Duplex Port: ±0.7 dB (1 MHz to 1 GHz), ±1 dB (1 GHz to 6 GHz) for level >-10 dBm RF Input Port: ±1.0 dB (1 MHz to 1 GHz), ±1.1 dB (1 GHz to 6 GHz) for level >-50 dBm

Spectrum Analyzer	
Frequency	
Frequency Range	9 kHz to 3 GHz (CX700) 3 GHz to 6 GHz (CX700-F6GHZ)
Resolution	1 Hz
Accuracy	Same as frequency standard
Span	
Mode	Center / Span and Zero Span and Full
Display / Marker Accuracy	Span / Number of points + Frequency Accuracy
Range	1 kHz/div to 100 MHz/Div plus Zero span & full span 10 divisions in a 1-2-5 sequence
Accuracy	±1% of span width
Level	
Resolution	1 dB
Units	dBm
RF Input Port Accuracy	≤+15 dBm and ≥-50 dBm: ≥1 MHz & <1100 MHz ±1.0 dB ≥1100 MHz & <2300 MHz ±1.1 dB ≥2300 MHz & <4500 MHz ±1.0 dB ≥4500 MHz & <6000 MHz ±1.1 dB <-50 dBm and ≥-100 dBm: ≥1 MHz & <1100 MHz ±1.3 dB ≥1100 MHz & <2300 MHz ±1.4 dB ≥2300 MHz & <4500 MHz ±1.3 dB ≥4500 MHz & <6000 MHz ±1.4 dB
RF Duplex Port Accuracy	≤+53 dBm and ≥-10 dBm: ≥1 MHz & <1100 MHz ±0.7 dB ≥ 1100 MHz & <2300 MHz ±0.7 dB ≥2300 MHz & <4500 MHz ±0.8 dB ≥4500 MHz & <6000 MHz ±1.0 dB ≤-10 dBm and ≥-60 dBm: ≥1 MHz & <1100 MHz ±1.0 dB ≥ 1100 MHz & <2300 MHz ±1.1 dB ≥2300 MHz & <4500 MHz ±1.1 dB ≥4500 MHz & <6000 MHz ±1.3 dB
Displayed Average Noise Level (DANL)	dBm/Hz, Ant Port, Receiver preamp on (-40 dBm), 1 Hz RBW, averaging on, 50Ω termination: -162 dBm from 1MHz to 1100 MHz -163 dBm from 1100 MHz to 2300 MHz -160 dBm from 1100 MHz to 4500 MHz -158 dBm from 4500 MHz to 6000 MHz
RBW	25 Hz to 6 MHz 1 Hz to 50 kHz in Channel analyzer
VBW	100 Hz to 5 MHz
Sweep Time Range	0.4 ms to 1000 s
Spurious Free Dynamic Range	≥80 dB
Display Range	1 dB/div to 20 dB/div with 10 divisions
Oscilloscope	
Channels	2
Level Accuracy	5% of full scale (DC to 1 MHz) 10% of full scale (1 MHz to 4 MHz)
Markers	6
Internal	
Internal Sample Clock Frequency	40 Ms/s sampling clock, 1 uSec/Div to 1 Sec/Div
Timebase Accuracy	Same as timebase
Input Coupling	AC, DC, GND

Trigger	
Modes	Automatic, Normal, Single Shot
Sources	CH1, CH2, External
Horizontal	
Sweep per div	20 µs to 1 s/div
Accuracy	<2%
Vertical	
Range	0.1 mV/div to 20 V/div
Accuracy	<5%
Bandwidth	100 kHz
Input Range	20 mV to 30 Vrms (42.4 Vpk)
Coupling	AC, DC
Input Impedance	1 MΩ single ended, ±1 % shunted by ≤ 300 pF, 200 kΩ differential, ±8 % max input voltage 30 VRMS
Zero Span Analyzer	
Sweep Time	
Range	24 µs to 200 s
Tracking Generator	
Output Ports	RF Output, RF Duplex
Level	
Range	Same as RF Generator
Accuracy	Same as RF Generator
I/Q Recorder	
Sample	
Length	4 Msamples memory or file on SSD, limited by SSD free space
Rate	Variable to support up to 100 MHz of analog bandwidth
Trigger	
Trigger Source	Free run
Digital Multi-Meter	
DC	
Voltage Scales	20 mV, 200 mV, 2 V, 20 V, 200 V, 2000 V
Voltage Range	0.1 to 300 V
Voltage Accuracy	±1% full scale (DC), ± 1 count
Current Range	20 mA, 200 mA, 2 A, 20 A (with shunt)
Current Accuracy	±1% Full Scale ±1 count
Resistance	
Accuracy	±1% Ohms
Range	200 Ohms to 200 M Ohms
Resolution	5 1/2 digits
AC	
Voltage Scales	20mV, 200mV, 2V, 20V, 200V, 2000V
Voltage Range	0.1 to 300 V
Voltage Accuracy	±5% full scale, ± 1 count (50 Hz to 10 kHz)
Current Range	10 mA to 2 A, 10 A (with external shunt)
Current Accuracy	±5% full scale, ± 1 count ±10% full scale, ± 1 count
Resolution	5 1/2 digits

Timebase	
Accuracy	±0.05 ppm max (0°C to 70°C)
Aging	±0.05 ppm/year max ±0.1 ppm/year max (first year)
External Reference	10 MHz
Additional Ports	
Serial Ports	2x RS-232 (422, 485) synchronous + 2x RS-232 (422, 485) asynchronous ports on UUT-(A/B) connectors
Ethernet	2x RJ45 1GbE on RIM Tray + 1x RJ45 1GbE back of the chassis + 1x 1GbE on the ZIF tied to first Ethernet device. 1x additional 1GbE on UUT-A tied to the second Ethernet device (Different IP stacks)
UUT-A	168 -pin ZIF connector compatible with legacy VIAVI test sets
UUT-B	55-pin MIL circular connector with additional I/Os for future-proofing
AC Input	
Operating voltage range	100 - 300 VAC
Input frequency range	47 - 66 Hz
Efficiency (typical)	91 - 95%
Power factor (typical)	0.98
Ride through (typical)	1 cycle
Holdup time	20 ms
GNSS Timing (SMA)	
Constellation standards	GPS (L1), GLONASS (L1, FDMA), Galileo (E1)
1 PPS accuracy	UTC ±10 ns (1-sigma, 1 satellite in track 24 hours)
Acquisition sensitivity	-146 dBm
Tracking sensitivity	-162 dBm
External Trigger Input (BNC)	
Max input level	±10 V
Max Toggle Rate	10 ns
Input impedance	1 kOhm
Minimum threshold (programmable)	250 mV
External Trigger Output (BNC)	
Output Level	3.3 V CMOS
Max toggle rate	10 ns
Output load	50 Ohm
Frequency Reference - Input	
Frequency	100 MHz
Duty Cycle	45 - 55%

Frequency Reference - Output	
Output frequencies (selectable)	10 MHz / 100 MHz
Output level	3.3 V CMOS
Output load	50 Ohm
USB	
	3.1 ports (x2 type A) on the rear of the unit, USB 2.0 ports (x2) on UUT-A connector, USB 2.0 ports (x2 type A) on the RIM tray front panel, USB 3.1 ports (x2 type A) on the front of the chassis
Removable Storage Access	
	M.2 SSD
Video/Monitor	
	Display Port
Built-in Power Supply with 3 Outputs (CX700-PS and CX700-PS-NOKVM)	
Output A	5-40V DC, 20A max, available on UUT-A connector
Output B	2-28V DC , 5A max, available on UUT-B connector
Output C	5V DC, 4A Max, available on UUT-B connector
Environmental/Physical	
Height	24.4 cm (9.6 in)
Width	46.2 cm (18.2 in)
Depth	49.0 cm (19.3 in)
Weight	34.3 kg (76 lbs) test set only, additional weight for accessories and case
Temperature, Not Operating	-40°C to 71°C
Temperature, Operating	0°C to 50°C
Relative Humidity	95%±5% from 10°C to 30°C 75%±5% from 31°C to 40°C 45%±5% from 41°C to 50°C
Altitude	4600 meters
Compliance	
Vibration	Random 5-500 Hz per Table 3 of MIL-PRF-28800F Class 3
Shock, Functional	30 G half-sine shock pulses per 4.5.5.4.1 of MIL-PRF-28800F Class 3
Bench Handling	MIL-PRF-28800F Class 3
Transit Drop	MIL-PRF-28800F Class 3
Use	Pollution degree 2
EMC	MIL-PRF-28800F EN61326-1: Class A (CE) EN61000-3-2 EN61000-3-3
Safety	
Power Requirement	100 - 300 VAC, 47 to 66 Hz
Standards	UL 6101B-1 EN 61010-1 CSA C22.2 No. 61010-1

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