VIAVI Solutions

Data Sheet

VIAVI
7200B

Configurable Automated Test Set

General Specifications

RF Signal Generator	
RF Frequency	
Frequency Range	1.0 MHz to 2.6 GHz
Frequency Accuracy	Same as timebase
Frequency Resolution	1 Hz
RF Output Level	
T/R Port	-30 dBm to -130 dBm
GEN Port	+10 dBm to -110 dBm
Accuracy	
GEN Port	±1.0 dB (>-110 dBm)
T/R Port	±1.0 dBm (>-120 dBm) ±2.5 dB (≤-120 dBm, >-130 dBm)
Resolution	
Display Resolution	0.1 dB
Step Size	0.1 dB
Port VSWR 50 Ohm	
T/R Port	<1.2:1 <1.05 GHz <1.3:1 >1.05 GHz to 2.6 GHz
GEN Port	<1.5:1 1.0 MHz to 1.0 GHz <1.9:1 1.0 GHz to 2.6 GHz (with attenuation)
SSB Phase Noise	
Typical Phase Noise (Normal Mode)	
RF Frequency	dBc / Hz @ 20 kHz offset
1 MHz	-131
100 MHz	-102
500 MHz	-102
800 MHz	-100
1200 MHz	-98
1700 MHz	-100
2000 MHz	-97
2350 MHz	-96
2600 MHz	-99
RF Generator Spurious	
Harmonics	<-30 dBc
Non-Harmonics	<-55 dBc
RF Generator Residual	
FM Residual	<15 Hz rms in 300 Hz to 3 kHz BW
AM Residual	<0.1% rms in 300 Hz to 3 kHz BW
RF Generator Modulations	
Selections	NONE, FM, AM, PM, SSB USB, SSB LSB, AM NRZ, FM NRZ, PM NRZ, SSB USB NRZ, SSB LSB NRZ, I/Q Files, I/Q Python
FM Deviation	
Range	±1.0 Hz to ±150 kHz
Accuracy	±3% of setting (from ±1 kHz to ±100 kHz deviation, 20 Hz to 15 kHz rate)
Rate	0 Hz to 40 kHz
FM Deviation Resolution	0.1 Hz
Waveform	Sine, square, triangle, ramp
THD (Total Harmonic Distortion)	<1% (1 kHz rate, 6 kHz deviation, 300 Hz to 3 kHz, Sine)
AM Modulation	
Range	0.1% to 100%
Accuracy	±1% modulation from 10% to 90%
Rate	0 Hz to 40 kHz
AM Modulation Resolution	0.1%
Waveform	Sine, square, triangle, ramp
THD (Total Harmonic Distortion)	<1% (1 kHz rate, 30 to 70% AM, 300 Hz to 3 kHz, Sine)
PM Deviation	
Range	0.1 radians to 10 radians
Rate	10 Hz to 40 kHz
Accuracy	±5% of setting

PM Deviation Resolution	<0.1 radians
Waveform	Sine, square, triangle, ramp
THD (Total Harmonic Distortion)	<1.0%
Internal Single-Sideband (SSB)	
Modulation Selection	Upper-Sideband (USB) or Lower-Sideband (LSB)
Modulation Range	0% to 100%
Resolution	0.1%
Rate	300 Hz to 3 kHz
Waveform	Sine, square, triangle, ramp
I/Q File	
Modulation Capability	Allows user to "RUN" arbitrary waveforms as modulation source
Types	Browse and load I/Q creator file
RF Generator Modulation (External Input)	
Types	AM, FM, PM
Sources	Audio 1
Accuracy	Audio In: With 1 Vrms, AM / FM / PM have same characteristics as internal sources, ±10% of indicated setting. [Audio 1, input from 20 Hz to 15 kHz (300 Hz to 3 kHz SSB), unbalanced]

RF Receiver

RF Frequency			
Frequency Range	1.0 MHz to 2.6 GHz		
Resolution	1 Hz		
Accuracy	Same as timebase		
Input Reference Level Scale			
ANT Port	10, 0, -10, -20, -40, -50, -70 dBm		
T/R Port	+50, +40, +30, +20, 0, -10 dBm		
RF Input Level			
Max Input Level			
ANT Port	+10 dBm, (damage will occur >+13 dBm)		
T/R Port	T/R RF Input Power ON / OFF times:		
	Peak RF Power	Max Time ON	Min Time OFF
	100 W	90 seconds	3 minutes
	150 W	30 seconds	3 minutes
	200 W	15 seconds	3 minutes
	T/R Input Over Temp Screen activation:		
	Alarm	Temperature	
	ON	>100° C	
	OFF	<100° C	
	Note 1: Remove RF input power any time the Over temp indicator appears on screen.		
Sensitivity			
ANT Port	-113 dBm (>10 dB SINAD, FM, 1 kHz rate, 6 kHz Deviation, 25 kHz BW, 300 Hz to 3.4 kHz AF Filter)		
Port VSWR 50 Ohm			
ANT Port	<1.5:1 (RF freq. <1.05 GHz) <1.9:1 (RF freq. >1.05 GHz to <2.6 GHz)		
T/R Port	See Section 3.1.3 Generator T/R Port VSWR		
RF Receiver Demodulation			
Selections			
None, AM, FM, PM, USB, LSB and all digital formats in section 3.1.12 I/Q Gen			
IF and Demod audio bandwidths / filters			
Selectivity			
AM / FM IF bandwidths	250 Hz, 3, 6.25, 12.5, 25, 50, 100 kHz		
FM IF bandwidths	300 kHz, 500 kHz, 5 MHz Other bandwidths available based on I/Q modulation scheme		

DEMOD Audio Filters Selections	
Filter	Type
NONE	No Filter
300 Hz	Low-Pass
5 kHz	Low-Pass
3 kHz	Low-Pass
15 kHz	Low-Pass
20 kHz	Low-Pass
0.3 to 3.0 kHz	Band-Pass
0.3 to 3.4 kHz	Band-Pass
0.3 to 5 kHz	Band-Pass
0.3 to 15 kHz	Band-Pass
0.3 to 20 kHz	Band-Pass
300 Hz	High-Pass
40 kHz	Low-Pass

Audio Routing and Definition	
Audio 1	Audio In Audio In Balanced 600 Ω
Audio 2	AF Gen Out Demod Out DD Gen Out Audio In Balanced 600 Ω
Audio Input Definition	
Audio Input Characteristics for the following meters:	AF Counter, AF Level Meter, SINAD Meter, Distortion Meter, BER
Front Panel Audio Inputs	Audio 1, unbalanced, chassis reference Audio 1 and Audio 2, balanced, 600 Ω differential input
Audio Input Impedance Audio 1	Hi-Z (>50 kΩ) - unbalanced input 300 Ω - unbalanced input 150 - unbalanced input
Audio Input Range	
Frequency	0 to 40 kHz
Level	0.15 Vrms to 30 Vrms with Hi-Z Input Impedance and 600 Ω balanced
Level	0.15 Vrms to 7 Vrms with 300 Ω or 150 Ω Input Impedance

Input Audio Filters Selections	
Filter	Type
NONE	No Filter
300 Hz	Low-Pass
5 kHz	Low-Pass
3 kHz	Low-Pass
15 kHz	Low-Pass
20 kHz	Low-Pass
0.3 to 3.0 kHz	Band-Pass
0.3 to 3.4 kHz	Band-Pass
0.3 to 5 kHz	Band-Pass
0.3 to 15 kHz	Band-Pass
0.3 to 20 kHz	Band-Pass
300 Hz	High-Pass
40 kHz	Low-Pass

Meters

RF Power Meter (Power measured in Receiver IF BW)	
Measurement Port	T/R Port and ANT Port
Frequency Range	1.0 MHz to 2.6 GHz
Input Range	
ANT Port	-100 dBm to +10 dBm
T/R Port	-60 dBm to +53 dBm (see duty cycle table in 3.2.2)
Resolution	4 digits for watts measurement or .01 dB for dBm measurement
Accuracy	
T/R Port	>.02 mW levels, ±10% power, ±1 count
ANT Port	>-100 dBm ±1.0 dB ±1 count (After Normalize Function)
Units of Measure	Watts, mWatts, and dBm (absolute and relative)
Span	5 kHz to 90 MHz

Receive RF Error Meter	
Frequency Range	1 MHz to 2.6 GHz
Error Meter Range	0 to ±5 MHz from displayed receiver frequency
Resolution	1 Hz
Accuracy	Same as timebase, ±1 count
Sensitivity	ANT and T/R Port, S/N >15 dB

AF Counter Meter	
Range	0 to ±100 kHz
Accuracy	±1 Hz
Resolution	0.1 Hz
Meter Source	
Audio Input	Audio 1 Input
DEMOD	

AF Level Meter (Source: Audio Input)	
Input Level Range	0 to 30 Vrms
Resolution	1 mV
Frequency Range	20 Hz to 40 kHz
Accuracy	5% (Unbalanced, Hi-Z, 300 Hz to 3 kHz, 0.1 to 30 Vrms)

AF Level Meter (Source: DEMOD)	
Receive FM Deviation	
Deviation Range	0 Hz to 150 kHz
Modulation Rate Range	20 Hz to 40 kHz
Accuracy	±5% plus source residual, ±1 count (1 to 150 kHz FM deviation, Modulation rate 1 kHz to 20 kHz). IF BW set appropriately for the received modulation BW
Resolution	1 Hz
Sensitivity	ANT and T/R Port, S/N >15 dB
Receive AM Modulation	
Depth	0% to 100%
Modulation Rate Range	20 Hz to 40 kHz
Accuracy	±3.0% of reading from 30% to 90%
Resolution	1%
Sensitivity	ANT Port, S/N >15 dB
Receive PM Modulation	
Range	0.1 to 10 radians
Rate	100 Hz to 1 kHz
Accuracy	±5.0% of reading
Resolution	0.01 radians
Sensitivity	ANT Port, S/N >15 dB

SINAD Meter	
Range	0 to 60 dB
Accuracy	±1 dB ±1 count
Resolution	0.01 dB
Notch Frequency	10 Hz to 10 kHz
Meter Source	
Audio Input	Audio 1 Input
DEMOD	

Distortion Meter	
Range	0.0% to 100.0%
Accuracy	< ±0.5% (Distortion 1% to 10%, 5 kHz LP AF filter) < ±1.0% (Distortion 10% to 20%, 5 kHz LP AF filter)
Resolution	0.1%
Notch Frequency	10 Hz to 10 kHz
Meter Source	
Audio Input	Audio 1 Input

Audio Output

Audio Frequency Generators	
Output Ports	Audio 2
Range	0 Hz to 40 kHz (Sine only)
Resolution	0.1 Hz
Frequency Accuracy	Same as timebase
Output Level	1 mV to 7 Vrms into a 10 kΩ load

Level Accuracy	1% of setting (10 kΩ load)
Total Harmonics Distortion	<0.5% (1 kHz, 5 Vrms, 80 kHz BW, 10 k load, Sine) <1.0% (Typical, 20 Hz to 20 kHz, 100 mV to 5 Vrms, 80 kHz BW, 10 k load, Sine)
Waveforms	Sine, square, triangle, ramp (10 Hz to 4 kHz, usable from 20 kHz)
Digital Data Generator	
Style	Generates Non Return to Zero (NRZ) style data
Data Rates	75, 150, 300, 600, 1200, 2400, 4800 bps and 16 kbps
Data Production Rates	100 to 100000 bits
Data Pattern Type	Random, fixed and user defined
Pattern	PN9, PN10, PN11, PN12, PN15 sequence
Accuracy	1 x 10^{-8}
Source	Modulation output Audio output
Level Accuracy	
Range	0.1 V to 5.0 V (digital)
Resolution	0.1 V
Accuracy	+3%
Spectrum Analyzer	
Frequency	
Range	1 MHz to 2.6 GHz (usable from 100 kHz)
Resolution	1 Hz
Frequency Accuracy	Same as frequency standard
Span	Span mode: Center / Span and Zero Span
Display / Marker Accuracy	Span accuracy + frequency accuracy
Span Range	Selection list is 5 kHz to full, plus zero span
Span Accuracy	±1% of span width
Horizontal Resolution	Span / (sweep points-1)
Level	
Input Level Range	
ANT Port Selected	See 3.2.1 and 3.2.2 for Input Level Range
T/R Port Selected	See 3.2.1 and 3.2.2 for Input Level Range
Reference Level Resolution	1 dB
Ref Level Units	dBm
Level Accuracy	±1 dB (Input Level Scale must be set and Normalize Function: See 3.2.1)
Residual Response	≤110 dBm input terminated with 50 ohm load
Harmonic Spurious	-55 dBc (Input Level of -30 dBm, Ref Level at -20 dBm)
Non-Harmonic Spurious	-60 dBc (Input Level of -30 dBm, Ref Level at -20 dBm)
3rd Order Intermodulation	-60 dBc (Input Level of -30 dBm, Ref Level at -20 dBm)
Displayed Average Noise Level (DANL)	dBm / Hz, 0 dB RF attenuation, 1 Hz RBW, averaging on, 50 Ω termination from 100 MHz to 2.6 GHz; -147 dBm
Vertical Scales	Logarithmic, 1 to 50 dB / division
Digitizer Dynamic Range	85 dB (maximum analysis BW 90 MHz, digitizer AGC resolution 14 bits)
Bandwidth Switching Error	≤±0.1 dB 5 k reference RBW, (After Normalize)
Display Range	200 dB
Resolution Bandwidths	1 Hz to 500 kHz in 1, 2, 5 sequence based on analyzer span
FFT WINDOW	Rectangle, Blackman, Hanning, Hamming, Triangle, Kaiser, Flattop
Oscilloscope	
Number of Channels	2
Bandwidth (-3 dB)	
All Ranges expect 0.04 Vpp DC to 125 Hz	
Range 0.04 Vpp	DC to 100 MHz
Input Impedance	50 Ω and 1 MΩ || 26 pF

Full-Scale Range and Programmable Vertical Offset

50 Ω		1 MΩ	
Range	Vertical Offset	Range	Vertical Offset
Vpp	Range V	Vpp	Range V
0.04	±0.8	0.04	±0.8
0.1	±0.8	0.1	±0.8
0.2	±0.8	0.2	±0.8
0.4	±0.8	0.4	±0.8
1.0	±6.5	1.0	±8.0
2.0	±6.0	2.0	±8.0
4.0	±5.0	4.0	±8.0
10	±2.0	10	±30
-	-	20	±25

Accuracy	
DC (0 V offset)	±(1.5% of input +0.3% of FS + 200 µV)
AC	±2.5% Full Scale (1 MHz to 20 MHz)
Internal	
Internal Sample Clock Frequency	250 MS / s sampling rate with decimation by n, 1 ≤n ≤65,535
Timebase Accuracy	±25 ppm (±0.0025%)
Input Coupling	
AC, DC, GND	AC coupling available on 1 MΩ only
Memory / Channel	64 MB
Trigger Modes	Auto, Normal, Single Shot
Trigger Sources	CH1, CH2, External
Timebase System	
Internal sample clock	Freq 250 Ms / s sampling rate
Internal accuracy	±25 ppm (0.0025%)

Digital Multi-Meter	
DC Functions	
DC Voltage Accuracy	±0.1% of full scale
DC Voltage Ranges	100 mV, 1 V, 10, 100 V, 300 V
DC Current Accuracy	±0.35% of full scale
DC Current Ranges	20 mA, 200 mA, 1 A (10 A with external shunt)
Resistance Accuracy	
100 Ω thru 1 MΩ	±0.05% of full scale
10 MΩ	±0.2% of full scale
100 MΩ	<30 MΩ ±1.0%, >30 MΩ ±1.5% of full scale
Resistance Ranges	100 Ω, 1 kΩ, 10 kΩ, 100 kΩ, 1 MΩ, 10 MΩ, 100 MΩ
Resolution	6 1/2 digits
AC Functions	
AC Voltage Ranges	50 mV, 500 mV, 5 V, 50 V, 300 mV
AC Voltage Accuracy	
50 mV, 500 mV scales	±0.2% of full scale
5 V, 50 V, 300 V scales	±0.8% of full scale
10 Hz to 20 kHz	Usable to 300 kHz
AC Current Ranges	10 mA, 100 mA, 1 A (10 A with external shunt)
AC Current Accuracy	10 mA and 100 mA scales; ±0.7% of full scale, 10 Hz to 30 kHz, 1 A scale; ±0.7% of full scale, 10 Hz to 10 kHz
Resolution	6 1/2 digits
Timebase	
Standard Oscillator	
Temperature Range	0° C to 50° C
Temperature Stability	Typically better than ±0.01 ppm
Aging	0.001 ppm per day, 0.01 ppm per year
Warm-Up Time	10 Minutes
Dimensions and Weight	
Height	20.32 cm (8 in)
Width	44.45 cm (17.5 in)
Depth	60.96 cm (24 in)
Weight	20.41 kg (45 lbs)
Environmental	
Operating Temperature	0 to 50° C (Tested in accordance with MIL-PRF-28800F Class 3)
Warm-up Time	15 minutes
Storage Temperature	-40 to 71° C (Tested in accordance with MIL-PRF-28800F Class 3)
Relative Humidity	80% up to 31° C decreasing linearly to 50% at 40° C (Tested in accordance with MIL-PRF-28800F Class 3)
Altitude	4,600 m (15,092 ft) (Tested in accordance with MIL-PRF-28800F Class 3)
Shock and Vibration	30 G shock (Functional shock) 5-500 Hz random vibrations (Tested in accordance with MIL-PRF-28800F Class 3)
Use	Pollution degree 2
EMC	MIL-PRF-28800F EN61326-1: Class A EN61000-3-2 EN61000-3-3
Reliability	>2500 hours
Safety	
Power Requirement	
AC Voltage	100 to 250 VAC, 47 to 63 Hz
Mains Supply Voltage Fluctuations	≤10% of the nominal voltage
Fuse Requirements	10 A, 250 V, Type F

Ordering Information

Versions and Options

Order Number	Description
139380	7200B Configurable Automated Test System 2.6 GHz
140870	7200 i7 Upgrade Kit
Options	
139406	7200 2 Channel 125 MHz Oscilloscope
139407	7200 6 1/2 Digit DMM
139260	7200 Frequency Hop Burst Power Meter
139272	7200 Record and Playback Feature
139263	7200 Remote Power Supply Control
Auto-Test and Alignments	
139264	7200 Auto-Test III Development Environment
Accessories	
86170	Case, Transit
67411	AC25014 Scope Probe Kit
86474	TPS ZIFF Mating Connector
87593	Adapter USB 2.0 to IEEE-488.2 GPIB
88574	7200 Rack Mount Kit
88770	750 W External Power Supply Transit Case
88863	750 W External Power Supply
88923	7200 Series DMM Probe Kit
88991	Cable Assembly - External DC Power (Req'd for 750 W External Power Supply for Pass Through to ZIFF)
89661	RJ45 5' Ethernet Cable
92554	Intelligent Cable for 7200B
11227	AC24011 10 Amp Current Shunt (0.01 Ohm)
140933	7200G SYS SFTWR, BLUE RAY SCRAPE DISK

Extended Warranties

91436	7200 1 Year Extended Hardware Warranty + ANSI No-Cert Calibrations
91437	7200 1 Year Extended Hardware Warranty + Certified Calibrations
91438	7200 3 Year Extended Hardware Warranty + ANSI No-Cert Calibrations
91439	7200 3 Year Extended Hardware Warranty + Certified Calibrations

VIAVI Solutions