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# РАДИОЧАСТОТНЫЕ РЕКОРДЕРЫ

MP 7200, 7300, 7600

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## ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

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# MP7200

# MP7300

# MP7600

## ADIVIC RF Recorder/Player Overview

MP7 series is a specific RF measurement instrument which is able to capture signals off the air and faithfully playback. To carry out field testing and performance testing, MP7 series are excellent assistance with fast signal analysis for all existing communication standards and modulation schemes regardless digital and analogue. In addition, it also allows users to precisely record and investigate the wanted signals, adjacent channel signals, noise/fading signals and any other distortion signals accordingly by means of excellent performance against spurious signals.

MP7200 is basic version for spectrum analysis within 25 MHz bandwidth.

MP7300 is specialized for the requirement of simultaneous two-channel recording/playback.

MP7600 is the most powerful version with wider bandwidth and compact housing for contemporary wireless communication standards.

## Benefits

1. Shorten design-in schedule because of evitable time-wasting virtual field testing
2. Flexible bandwidth extension with the availability of interconnection between instruments
3. Passive and active input ports enable receiving different power signals
4. Recording fluctuated spectrum is feasible via MAGC function
5. High spectrum sensitivity performance because of low noise floor ( $< -165$  dBm/Hz)
6. Precise measurement in accordance with excellent spurious response.
7. High resolution in order to avoiding unnecessary distortion as recording and playback
8. Diminish space limitation during recording via remote control with 10 MHz sync. port
9. Swapable SSD enables prolonged recording
10. In support of various worldwide communication standards
11. Instinctive control by user-friendly GUI



## MP7200 Features

1. Adjustable bandwidth from 1 MHz to 25 MHz
2. Frequency coverage from 25 MHz to 2.7 GHz
3. Active and passive RF input port
4. 100 MS/s sampling rate in recording and playback path respectively
5. 14-bit resolution
6. In support of GPS NMEA data logging recording
7. Remote control available
8. Data formats compatible to MATLAB analyzer
9. Software utility support including I/Q data extractor and File segment

# Specification

## MP7200 2.7 GHz RF Signal Analyzer Specifications

### Frequency

Frequency range	.....25 MHz to 2.7 GHz
Low Frequency Extend - option	.....300 KHz to 25 MHz
Real-time bandwidth	.....1 to 20 MHz(20 MHz Guaranty BW)
Frequency resolution	.....1 KHz step minimum
Resolution bandwidth (RBW)	.....Fully adjustable (100 Hz to 3 MHz)
Warm-up time (typical)	.....30 minutes
Temperature stability	.....±20 ppb maximum
Initial achievable accuracy	.....±50 ppb maximum
Aging	
Per year	.....±100 ppb maximum
Per day	.....±1 ppb maximum
Initial achievable accuracy	.....±50 ppb maximum

### Spectral purity

Phase Noise @ 1 KHz offset, 1 GHz	.....< -80 dBc/Hz
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### RF input Spurious Response

	.....< -90 dBm
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### Noise Density

Passive Port (Gain : 40 dB / 100 MHz)	.....< -165 dBm/Hz
Active Port (Gain : 20 dB / 100 MHz)	.....< -145 dBm/Hz

### Amplitude(Passive Port)

Input level Accuracy ( 15 to 35°C )	.....< ±1 dB
Input signal range@CW mode	.....-145 dBm to -30 dBm
Gain Range	.....0 to +40 dB @ 5 dB step
Input level resolution	.....0.01 dB
Maximum DC input	.....±25 VDC
Group delay	.....30 ns Typical

### Amplitude (Active Port)

Input level Accuracy ( 15 to 35°C )	.....< ±1dB
Input signal range @ CW mode	.....-135 dBm to +10 dBm
Gain Range	.....-5 to +20 dB @ 5 dB step
Input level resolution	.....0.01 dB
DC Voltage Output Range	.....0 to +10 V @ 0.1 V/step
Group delay	.....30 ns Typical

### RF input

Passive RF input	.....50 Ω , AC-coupled N female
Active RF input	.....50 Ω , DC-coupled N female

### IF Band

Resolution	.....14-bit
Sample rate	.....100 MS/s

### Storage

Storage	.....640 GB
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### Calibration

Calibration	.....1 year
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### Environment

Operating temperature	.....0 to +50 °C
Relative humidity	.....10 to 90%
Storage temperature	.....-20 to 70 °C
Relative humidity	.....5 to 95%

## MP7200 2.7 GHz RF Signal generator Specifications

### Frequency Characteristics

Frequency range	.....25 MHz to 2.7 GHz
Real-time bandwidth (Digital vector modulation bandwidth)	.....20 MHz maximum
Frequency resolution	.....1 KHz / step minimum
Warm-up time (typical)	.....30 minutes
Temperature stability	.....±20 ppb maximum
Per year	.....±100 ppb maximum
Per day	.....±1 ppb maximum
Initial achievable accuracy	.....±50 ppb maximum

### Spectral purity

Phase Noise @ 1 KHz offset, 1 GHz	.....< -80 dBc/Hz
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### Spurious Responses

Second harmonic	.....< -40 dBc
Output third-order distortion (IMD) (two -13 dBm tones, > 200 KHz apart)	.....-70 dBc Typical
LO leakage	.....< -80 dBm

### RF Output Characteristics

Output power range	.....-145 dBm to -10 dBm
Amplitude resolution	.....0.1 dB step minimum
Amplitude Accuracy	.....< ±1 dB -100 dBm to -10 dBm .....< ±2 dB < -100 dBm
Output Impedance	.....50 Ω

### Overload protection on RF output

Maximum reverse RF power	.....1 Watt maximum
Maximum DC input	.....±25 VDC

### Noise Floor@1GHz

-40 dBm output power	.....< -150 dBm/Hz Typical
-50 dBm output power	.....< -165 dBm/Hz Typical

### Flatness

IF Band(20MHz) flatness	.....1 dB Typical
Group delay	.....30 ns Typical

### RF Output

RF Output	.....50 Ω , AC-coupled N female
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### IF Band

Resolution	.....14-bit
Sample rate	.....100 MS/s

### Calibration

Calibration	.....1 year
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### Operating Environment

Operating temperature	.....0 to +50 °C
Relative humidity	.....10 to 90%
Storage temperature	.....-20 to 70 °C
Relative humidity	.....5 to 95%

### Power

AC	.....100 V to 240 V
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### Mechanical

Dimensions	.....350 mm x 300 mm x 230 mm
Weight	.....approx. 14.3 kg

## MP7300 Features

1. Adjustable bandwidth from 1 MHz to 45 MHz
2. Frequency coverage from 300 KHz to 3.0 GHz
3. Active and passive RF input port
4. 250 MS/s sampling rate in recording and playback path respectively
5. 16-bit resolution for Rx and 14-bit for Tx
6. 2 channels with 22.5 MHz recording and playback
7. Diversity receiver and generator
8. In support of GPS NMEA data logging recording
9. Remote control available
10. Pre-trigger recording function
11. Data formats compatible to MATLAB analyzer
12. Software utility support including I/Q data extractor and File segment



### MP7300 3.0 GHz RF Signal Analyzer Specifications

#### Frequency

Frequency range : 300 KHz to 3.0 GHz  
Continuous bandwidth : 45 MHz  
Frequency resolution : 1 KHz / step minimum  
Resolution bandwidth (RBW) : Fully adjustable (100 Hz to 3 MHz)  
Warm-up time (typical) : 30 minutes  
Temperature stability :  $\pm 20$  ppb maximum  
Initial achievable accuracy :  $\pm 50$  ppb maximum

#### Aging

Per year :  $\pm 100$  ppb maximum  
Per day :  $\pm 1$  ppb maximum  
Initial achievable accuracy :  $\pm 50$  ppb maximum

#### Spectral purity

Phase Noise @ 1 KHz offset, 1 GHz :  $< -80$  dBc/Hz  
RF input Spurious Response :  $< -90$  dBm

#### Noise Density

Passive Port (Gain : 40 dB / 100 MHz) :  $< -165$  dBm/Hz  
Active Port (Gain : 20 dB / 100 MHz) :  $< -145$  dBm/Hz

#### Amplitude(Passive Port)

Input level accuracy ( 15 to 35 °C ) :  $\pm 1$  dB  
Input signal range @ CW mode : -145 dBm to -30 dBm  
VSWR @ 40 dB Gain :  $< 2.5$   
Gain Range : 0 to +40 dB @ 5 dB step  
Input level resolution : 0.01 dB  
Maximum DC input :  $\pm 50$  VDC  
Group delay variation : 30 ns Typical

#### Amplitude (Active Port)

Input level accuracy ( 15 to 35 °C ) :  $\pm 1$  dB  
Input signal range @ CW mode : -135 dBm to +10 dBm  
VSWR @ 25 dB :  $< 2.5$   
Gain Range : -5 to +20 dB @ 5 dB step  
Input level resolution : 0.01 dB  
DC Voltage Output Range : 0 to +10 V @ 0.1 V / step  
Group delay variation : 30 ns Typical

#### RF input

Passive RF input : 50  $\Omega$  , AC-coupled N female  
Active RF input : 50  $\Omega$  , DC-coupled N female

#### IF Band

Resolution : 16-bit  
Sample rate : 250 MS/s

#### Storage

Storage : SSD 300 GB X 4

#### Calibration

Calibration : 1 year

#### Environment

Operating temperature : 0 to +50 °C  
Relative humidity : 10 to 90%  
Storage temperature : -20 to 70 °C  
Relative humidity : 5 to 95%

#### Frequency Characteristics

Frequency range : 300 KHz to 3.0 GHz  
Real-time bandwidth (Digital vector modulation bandwidth) : 45 MHz maximum  
Frequency resolution : 1 KHz / step minimum  
Warm-up time (typical) : 30 minutes  
Temperature stability :  $\pm 20$  ppb maximum  
Per year :  $\pm 100$  ppb maximum  
Per day :  $\pm 1$  ppb maximum  
Initial achievable accuracy :  $\pm 50$  ppb maximum

#### Spectral purity

Phase Noise @ 1 GHz, 1KHz offset :  $< -80$  dBc/Hz

#### Spurious Responses

Second harmonic :  $< -40$  dBc

#### IMD3

(two -13 dBm tones,  $> 200$  KHz apart) : -70 dBc Typical  
LO leakage :  $< -80$  dBm

#### RF Output Characteristics

Output power range :  $\geq 25$  MHz : -145 dBm to +5 dBm /  
 $< 25$  MHz : -145 dBm to -10 dBm  
Amplitude resolution : 0.1 dB / step minimum  
Amplitude Accuracy :  $< \pm 1$  dB -100 dBm to -10 dBm /  
 $< \pm 2$  dB  $< -100$  dBm  
Output Impedance : 50  $\Omega$

#### Voltage Standing Wave Ratio (VSWR)

25 MHz to 3.0 GHz :  $< 2.5$

### MP7300 3.0 GHz RF Signal Generator Specification

#### Overload protection on RF output

Maximum reverse RF power : 1 Watt maximum  
Maximum DC input :  $\pm 25$  VDC

#### Noise Floor @ 1GHz

-10 dBm output power :  $< -120$  dBm/Hz Typical  
-20 dBm output power :  $< -130$  dBm/Hz Typical  
-30 dBm output power :  $< -140$  dBm/Hz Typical  
-40 dBm output power :  $< -150$  dBm/Hz Typical  
-50 dBm output power :  $< -160$  dBm/Hz Typical

#### Flatness

IF Band(20 MHz) flatness : 1 dB Typical  
Group delay Variation : 30 ns Typical

#### RF Output

RF Output : 50  $\Omega$  , AC-coupled N female

#### IF Band

Resolution : 14-bit  
Sample rate : 250 MS/s

#### Calibration

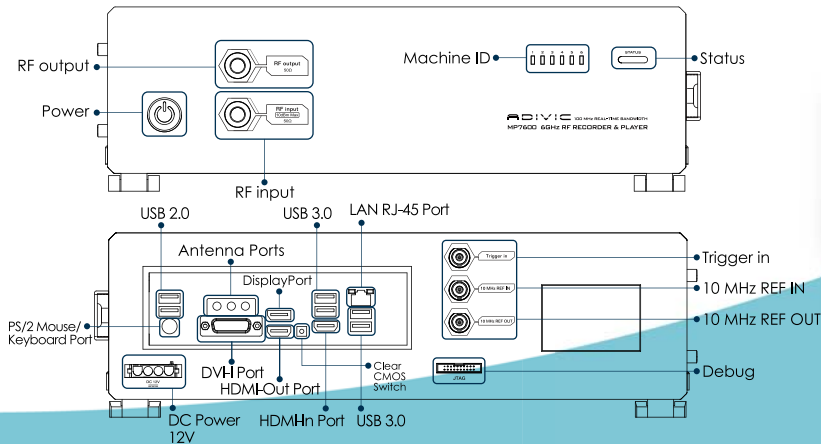
Calibration : 1 year

#### Operating Environment

Operating temperature : 0 to +50 °C  
Relative humidity : 10 to 90%  
Storage temperature : -20 to 70 °C  
Relative humidity : 5 to 95%

## MP7600 Features

- Adjustable instantaneous bandwidth 1 MHz to 100 MHz
- Frequency coverage from 300 KHz to 6.0 GHz
- 250 MSPS ADC sampling rate
- 16-Bit ADC/DAC resolution, 96 dB dynamic range
- Smart AGC to extend usable dynamic range > 150dB
- High linearity to accommodate strong & weak signal
- 1PPS, IRIG-B support (Optional)
- Additional traces for maximum/minimum holds
- 20+ markers for easy signal identification
- Data formats compatible to MATLAB
- Software utility support including I/Q data extractor and File segment
- Matrix System supports 7 units max. in parallel (Optional)
- 4 X 2.5"SSD internal drive bays (4 X 480 GB by default, 4 X 1 TB upgradable)



**Mechanical**  
Dimensions : 355.8mm X 302.4mm X 102.4mm  
Weight : 9Kg

### RF Signal Analyzer Specifications

Parameter	Specifications
Input Frequency Range	300KHz ~ 6000MHz
Real - time bandwidth	50MHz@300KHz ~ 50MHz 20MHz@ Fc: >50 ~100MHz 40MHz@ Fc: >100 ~400MHz 100MHz@ Fc: >400MHz and above
Frequency resolution	10Hz/step minimum
Resolution Bandwidth(RBW)	500Hz to 5MHz
Max input power	+20dBm peak · +10dBm average
Input noise density	<-160dBm/Hz
Input power accuracy @(+20 to -75 dBm)	<+/-1.0dB @ <=3GHz <+/-1.5dB @ >3GHz
Phase Noise	Phase noise <-100dBc @ 1KHz offset @2.4GHz Phase noise <-95dBc @ 1KHz offset @5.8GHz
LO Leakage *	<-50dBc
Sideband image*	<-50dBc
Third order input inter -modulation distortion(IMD3)	<-70dBc@ -10dBm (-13dBm two tone) ,
Input Return loss	<-10dB
ADC resolution	16 Bits
Sample rate	250MS/s
Initial achievable accuracy	+/-50 ppb maximum ( OCXO) @25C, after 60 minutes warm up
Temperature stability	+/-20 ppb maximum (OCXO) @0 C ~ 40 C,
Aging	+/-1 ppb maximum (OCXO) per day +/-100 ppb maximum (OCXO) per year
Operating Temperature	0 C to 40 C
Warm-up time	>30 minute

\* Test condition @ after calibration, AGC, ADC input Ref(-15), CW Signal  
dBc= Input signal level – LO or Sideband Image level

### RF Signal Generator Specification

Parameter	Specifications
Input Frequency Range	300KHz~6000MHz
Real time bandwidth	50MHz@300KHz ~ 50MHz 20MHz@ Fc: >50 ~100MHz 40MHz@ Fc: >100 ~400MHz 100MHz@ Fc: >400 and above
Frequency resolution	10Hz step minimum
Max Output power@ CW	0dBm
Output noise density	<-160dBm/Hz
Power Accuracy@(0 to -95 dBm)	+/-1.0dB @ -100dBm ~0dBm +/-2.0dB @ <-100dBm
Phase Noise	Phase noise <-100dBc: 1KHz offset @2.4GHz Phase noise <-95dBc: 1KHz offset @5.8GHz
LO leakage*	<-50dBc
sideband image*	<-50dBc
Third order input inter-modulation distortion(IMD3)	<-60dBc@-10dBm (two -13dBm Tone)
Output Return loss	<-10dB
DAC resolution	16 Bits
Sample rate	1000MS/s
Initial achievable accuracy	+/-50 ppb maximum (OCXO) @25C, after 60 minutes warm up
Temperature stability	+/-20 ppb maximum(OCXO) @0 C ~ 50 C range, referenced to 25 C
Aging@range, referenced to 25 C	+/-1 ppb maximum(OCXO) @ by day +/-100 ppb maximum(OCXO) & by year
Operating Temperature	0 C to 40 C
Warm-up time	>30 minute

\*Test condition @ after calibration, AGC, ADC input Ref(-15), CW Signal  
dBc= Output signal level – LO or Sideband Image level

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