

# POWER SENSORS

## Statistical Power Sensor

±3% ACCURACY

## 7022 SERIES



## Statistical Sampling for Precise RF Measurement

The Bird line of Statistical Power Sensors take measurement beyond signal average power for complex wireless systems. Because this measurement is no longer a sufficient control variable, the 7022 Series power sensors measure the percentage of time the signal exists at a specific peak-to-average ratio. In the time domain mode, the sensor adds a variety of functions similar to an oscilloscope to our standard suite of measurements.

The statistical power sensor is flexible enough to be used in all known communication formats and is able to accurately provide a wide range of RF measurements for non-periodic signals such as EVDO, UMTS, LTE, and HDTV. Calibration is traceable to NIST standards and no field calibration is required.

### PRODUCT FEATURES

- Provides Forward and Reflected Power, Peak/ Pulse Power, Time Domain and Statistical Measurements
- Three operating modes: Conventional, Time Domain and Statistical
- Analytical results of Signal of Interest using CCDF parameters
- Detailed breakdown of a single or multiple pulses
- Isolate and identify specific breakpoints with the use of markers
- Includes a wide range of IEEE pulse parameters

### APPLICATIONS

- Analog Cellular, Digital Cellular, 3G, 4G, Tetra, APCO/ P25 Phase 1 & 2, DMR, MOTOTRBO, Tunking, CDMA, TDMA, WCDMA, GSM, Transportation, Tactical Military, Radar, Avionics, Marine, LMR, Analog Broadcast, Digital Broadcast, GSM, GPRS, EDGE, UMTS, HSDPA, Bluetooth, Fire, GPS, NPSPAC, Paging, Public Safety, Telematics, Utilities, WIMAX, WLAN, EVDO, UMTS, LTE, and HDT

### MEASUREMENT

Measurement Type	ThruLine Power
Frequency Range	350 MHz to 6 GHz
Frequency Measurement Accuracy	±3% of reading with CW signals
Power Measurement Range*	0.025 W to 500 W average Average Power Rating limited, see chart
Dynamic Range	33 dB
Peak to Average Ratio	12 dB, absolute peak power limited to 1500 W
Impedance	50 Ohms nominal
Insertion Loss	0.05 dB max
Insertion VSWR	1.065, 350 to 2500 MHz max 1.12, 2500 to 6000 MHz max
Directivity, Min	<-30 dB, 350 to 1000 MHz, <-28 dB, 1000 to 4000 MHz**, <-24 dB, 4000 to 6000 MHz**

\* Derate maximum average power rating from 500 W at 300 MHz to 100 W at 6 GHz using a straight line on a log-log scale.

### CONNECTORS

RF Connectors	N Female
Display Interface	USB 2.0 Type B (USBTMC)
Trigger Input	BNC female (1MΩ Impedance; 3 V High, 1.2 V Low)

### SYSTEM

Factory Calibration	NIST traceable
Field Calibration	No field calibration required
Data Logging	Yes, with the VPM3 software
Power Supply	USB Port
Sample Rate	44 M samples/s max
Time Resolution	50 nSec to 10 Sec
Time Base Accuracy	.01%
Display Refresh Rate	10 times/sec (Limited by communication)
Video Bandwidth	Settable: 20 MHz (none), 5 MHz, 400 kHz, 4.5 kHz
Points per screen	1001

### ENVIRONMENTAL

Operating Temperature	-10 °C to 50 °C (14 °F to 122 °F)
Storage Temperature	-40 °C to 80 °C (-40 °F to 176 °F)
Humidity	95% max (non-condensing)
Altitude	Up to 15,000 ft (4,572 m)

### PHYSICAL

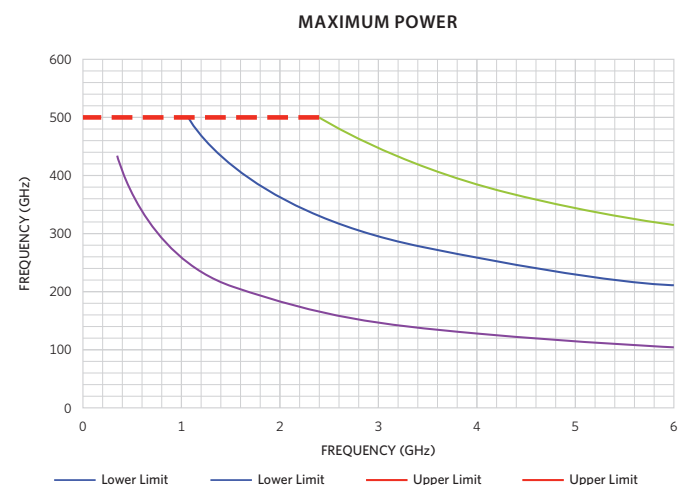
Size	5.8 in x 4.8 in x 1.3 in (147 mm x 122 mm x 33 mm)
Weight	1.5 lb (0.68 kg)

### CERTIFICATIONS

CE	EMC Directive (2004/108/EC) European Standard: EN 61326— Electrical Equipment for measurement, control and laboratory use; EMC Requirements; Test Spec (for radiated immunity): EN 61000-4-3 - Testing and measurement techniques - 10V/meter
Shock	Mil-PRF-28800F Class 3
Vibration	Mil-PRF-28800F Class 3
RoHs	Compliant

### STANDARD ACCESSORIES

5A2653-6L2	USB SeaLatch™ Cable
VPM3	Virtual Power Meter
920-7022	Manual for Statistical Power Sensor
920/VPM3	920-VPM3 Manual for Virtual Power Meter
5A2918-11-6	BNC / BNC Trigger Cable



### STATISTICAL MODE

<b>Peak-to-Average Ratio (Horizontal Axis)</b>	0 to 16 dB
<b>Percent Time Above Average Power (Vertical Axis)</b>	.0001 to 100% (log display)
<b>Number of Samples**</b>	268 M samples max
<b>Elapsed Time*</b>	6.5 s max
<b>Confidence Band*</b>	85 to 99.99 adjustable
<b>Modes on Full Buffer</b>	Restart Stop

\*\*Number of Samples, Elapsed Time and Confidence Band are all related, if one is set the other two parameters are calculated.

### AVERAGE MODE

<b>Average Forward Power Range</b>	0.25 W to 500 W
<b>Average Forward Power Accuracy</b>	4% of reading $\pm$ 16 mW +3% outside 15-35°C
<b>Average Reflected Power Range</b>	0.025 W to 50 W
<b>Average Reflected Power Accuracy</b>	4% of reading $\pm$ 1.6 mW +3% outside 15-35°C
<b>Return Loss</b>	0 to 23 dB
<b>VSWR</b>	1.15 to 99.9
<b>Rho</b>	0.07 to 1.0

### TIME DOMAIN MEASUREMENT MODE

<b>Peak Envelope Power Accuracy (up to 500 W)</b>	$\pm$ 5% +3.75% outside 15-35°C
<b>Peak Envelope Power</b>	up to 500 W
<b>Peak Envelope Power Accuracy (500 W to 1500 W)</b>	$\pm$ 11% +3.75% outside 15-35°C
<b>Burst Average Power Accuracy (0.25 W to 2 W)</b>	$\pm$ 7% +3.75% outside 15-35°C
<b>Burst Average Power Accuracy (2 W to 500 W)</b>	$\pm$ 5% +3.75% outside 15-35°C
<b>Burst Average Power Accuracy (500 W to 1500 W)</b>	$\pm$ 11% +3.75% outside 15-35°C
<b>Pulse Measurements</b>	All IEEE Std 194 Pulse Parameters Pulse off time Pulse width Pulse fall-time Pulse repetition frequency Pulse rise time Pulse period Pulse duty cycle Peak power Pulse overshoot
<b>Triggers</b>	Auto Free run Marker based (video trigger) External Trigger hold off

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