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Data Sheet

RadiPower[®] 2000 Pulse Series

RF Power Meter

Flexible

Versatile

Fast



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Version 1



RadiPower® Pulse Series

The accurate EMC Power Meter

Flexible | Versatile | Extensible

An adequate power meter is indispensable to perform reproducible and reliable RF power measurements. The RadiPower® Pulse offers a range of RF power meters dedicated for RF/Burst power measurements. The RadiPower® Pulse USB power heads are affordable, accurate and extremely fast. The RPR2006P provides measurements over a frequency range from 9 kHz up to 6 GHz. The RPR2018P measures over a frequency range of 80 MHz up to 18 GHz.

Extremely Fast

The RadiPower® Pulse USB power heads perform power measurements with a maximum sampling speed of 1 million samples per second! By using such a high sampling mode it is capable to measure RF Burst/Pulse signals with pulse durations down to 2 ns and it can measure CW and RMS power as well.

Accurate

Next to speed, accuracy is another main requirement when performing RF Burst/Pulse power measurements. The RPR2006P allows high precision RF power measurements with a high dynamic range of over 65 dB. Both power meters provide a basic accuracy of 0.25 dB and are way within requirements for measurements in accordance to international EMC immunity standards.

Flexible

The RadiPower® plug-in card (USB1004A) contains 4 USB slots to connect a maximum of four RadiPower® power heads of any combination and is designed to fit into the RadiCentre® EMC test systems. Alternatively the RadiPower® heads can be connected directly to a PC USB port.

'RMS' and 'Peak' mode

Using the 'RMS' mode an unmodulated RF power signal can be measured with a maximum speed of 10 MSps. But, the RadiPower® Pulse is not only able to measure extremely fast. In 'Peak' mode the RadiPower® Pulse keeps track of the highest level detected. This can be done for an infinite time.

'Envelop trace' mode

The 'envelop trace' mode can be used to visualize an RF/Burst signal using an internal buffer that can store 4.000 samples, using 2.000 pre-trigger measurements and 2.000 post-trigger measurements. The RadiPower® supports 'edge' or 'level' triggering modes and using this mode RF Burst signals can be visualized in a very easy way. This unique function can be used to perform different kind of RF Burst/Pulse measurements including the RI-114 Radar Pulse power measurements in accordance to the Automotive Ford standard FMC1278.

Software support

The standard RadiMation® FREE freeware control software fully supports the RadiPower® measurement modes where the measurement parameters can be configured and the results are graphically displayed or printed/exported. Beside this RadiMation® EMC test software can be used to perform fully automated immunity tests and control of the RadiPower power meter. Using the instrument command codes the RadiPower® can be used with any other software control package.

RadiPower® Pulse Series

Model	RPR2006	RPR2018
Measuring function	CW power, Peak power, Envelop tracing (P version only)	
Measurement speed	20 kSps, 100 kSps, 1 MSps	
Resolution	0,01 dB	
Measuring units	dBm or Watt	
Zero adjustment	Not required	
Input damage level	> +20 dBm	
Measurement range & accuracy		
Frequency range	(4 kHz) 9 kHz to 6 GHz	80 MHz to 18 GHz
Power measuring range	-55 dBm to +10 dBm (Usable to -60 dBm)	-45 dBm to +10 dBm (Usable to -50 dBm)
Frequency response accuracy (at 23°C ± 2°C)	+/- 0,25 dB	+/- 0,25 dB (≤ 10 GHz) +/- 0,50 dB (> 10 GHz)
Linearity error	0,05 dB + 0,005 dB/dB (-50 dBm to +10 dBm)	0,025 dB / dB (-40 dBm to +10 dBm)
Temperature effect	0,15 dB max over full temperature range	
VSWR		
< 100 MHz	1,05	1,20
100 MHz to 2 GHz	1,15	1,20
2 GHz to 6 GHz	1,35	1,20
6 GHz to 18 GHz	n/a	1,35
Power Consumption		
Supply voltage	+5Vdc from USB port (4,75 V to 5,25 V)	
Current consumption (USB)	120 mA	160 mA
Connections & Demensions		
Dimensions of the power sensor (h * b * d)	124 * 32 * 32 mm	152 * 32 * 32 mm
RF input connector	N type precision	
USB connector	USB type B (1.1)	
Enviromental conditions		
Temperature range (operating)	0° to 40° Celsius	
Temperature range (storage)	-20 to 85° C	
Relative humidity	10 - 90% (non-condensing)	
Warranty		
Warranty	3 years* (excluding misuse)	

Model	USB1004A
Supply voltage	12 V
Current consumption (USB)	100 mA max.
Dimensions of the power sensor (h * b * d)	2U * 84TE * 250,4mm
Data connector	USB type A (1.1)
Number of power sensors per card	4 max.
Temperature range (operating)	0° to 40° Celsius
Temperature range (storage)	-20 to 85° C
Relative humidity	10 - 90% (non-condensing)



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RadiPower® 2000 Series

RF Power Meter

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RadiPower[®] 2000 Series

The accurate EMC Power Meter

Flexible | Versatile | Extensible

An accurate and fast power meter is indispensable to perform reliable EMC measurements. The RadiPower offers a range of RF power meters for CW or Burst/Pulse power measurements during EMC tests. The RadiPower offers an affordable, accurate and extremely fast CW power meter. It provides measurements within 0.25 dB over a frequency range from 4 kHz up to 6 GHz and 80 MHz up to 18 GHz, which enables effective measurements in accordance with the latest international EMC standards.

Fast

EMC immunity measurements are time consuming, where the total test time is depending on the number of frequency points, the dwell time and the speed of the power meter. As the EMC standards prescribe the first two parameters, the speed of the power meter is the only one that can be optimised. Most RF power meters tend to get relatively slow at low power (test) levels. The RadiPower uses a detector with 1 Msps sampling speed which provides fast power measurement over its complete power range, even at low power levels.

Accurate

Next to speed, accuracy is the second important parameter when performing EMC measurements. The RadiPower has an accuracy of 0.25 dB which is extremely suitable for immunity testing in accordance to Automotive, CE-marking and Military standards. The RadiPower has a very low Standing Wave Ratio (SWR) and this will result in a low impedance mismatch, which is one of the contributions to the measurement uncertainty in RF power measurements.

Ruggedized

The RadiPower USB power meters are mounted in a very ruggedized metal housing to ensure long life and excellent shielding. The power meter is equipped with an N-type precision input connector.

Wide band

The RadiPower 6 GHz (model RPR2006C) has a standard frequency range from 9 kHz to 6 GHz which is covering most conducted- and radiated susceptibility tests. The 4 kHz low frequency extension (option #010) enables the RPR2006C to be used from 4 kHz, like required in MilStd. 461 CS-114, BCI common mode test on power cables. The RadiPower 18 GHz (model RPR2018C) covers power measurements from 80 MHz to 18 GHz.

Flexible

The RadiPower USB power meter can be connected to the USB1004A plug-in card which contains 4 USB inputs. The USB1004A plug-in card is designed to fit in the RadiCentre 19-inch rack-mountable modular system and together with the other available plug-in cards an affordable and comprehensive EMC test system can be configured. Alternatively, the RadiPower USB power head can be connected directly to a PC using the a standard USB port.

Software support

For stand-alone applications, the RadiPower USB power meter can be controlled by RadiMation Free which is standard delivered with each RadiPower. In case the RadiPower is used in a RadiCentre, it is software controllable through one of the available interfaces (USB, LAN, IEEE-488). Furthermore, the RadiPower can be controlled by RadiMation integral EMC measurement software and/or any other measurement packages as all software command codes to control the unit are available.

RadiPower® 2000 Series

Model	RPR2006	RPR2018
Detector type	Log envelop detector	
Measuring function	CW power	
Measurement speed	20 kSps, 100 kSps, 1 MSps	
Resolution	0,01 dB	
Measuring units	dBm or Watt	
RF input impedance	50 Ohm	
Input damage level	> +20 dBm	
Measurement range & accuracy		
Frequency range	(4 kHz) 9 kHz to 6 GHz	80 MHz to 18 GHz
Power measuring range	-55 dBm to +10 dBm (Usable to -60 dBm)	-45 dBm to +10 dBm (Usable to -50 dBm)
Frequency response accuracy (at 23°C ± 2°C)	+/- 0,25 dB (≤ 6 GHz)	+/- 0,25 dB (≤ 10 GHz) +/- 0,50 dB (> 10 GHz)
Linearity error	0,05 dB + 0,005 dB/dB (-50 dBm to +10 dBm)	0,025 dB / dB (-40 dBm to +10 dBm)
Temperature effect	0,15 dB max over full temperature range	
VSWR		
< 100 MHz	1,05	1,20
100 MHz to 2 GHz	1,15	1,20
2 GHz to 6 GHz	1,35	1,20
6 GHz to 18 GHz	n/a	1,35
Power Consumption		
Supply voltage	+5Vdc from USB port (4,75 V to 5,25 V)	
Current consumption (USB)	120 mA	160 mA
Connections & Demensions		
Dimensions of the power sensor (h * b * d)	124 * 32 * 32 mm	152 * 32 * 32 mm
RF input connector	N type precision	
USB connector	USB type B (1.1)	
Enviromental conditions		
Temperature range (operating)	0° to 40° Celsius	
Temperature range (storage)	-20 to 85° C	
Relative humidity	10 - 90% (non-condensing)	
Warranty		
Warranty	3 years after product registration (excluding misuse)	
Model		
USB1004A		
Supply voltage	12 V	
Current consumption (USB)	100 mA max.	
Dimensions of the power sensor (h * b * d)	2U * 84TE * 250,4mm	
Data connector	USB type A (1.1)	
Number of power sensors per card	4 max.	
Temperature range (operating)	0° to 40° Celsius	
Temperature range (storage)	-20 to 85° C	
Relative humidity	10 - 90% (non-condensing)	



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Data Sheet

RadiPower® 3000 series

RF Power Meter

Fast

Accurate

Easy to use



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RadiPower[®] 3000 Series

Fast Synchronous Power Measurements · Flexible

Fast

Accurate

Easy to use

Raditeq offers the RadiPower model RPR3006W to comply with the measurement requirements of the ETSI 300 328 and 301 893 standards for wideband data transmission systems, like IEEE 802.11TM, Bluetooth and ZigbeeTM. The RPR3006W covers a measurements range from 10 MHz to 6 GHz. The RPR3008W now covers a measurement range of 10 MHz to 8 GHz to include the new WI-FI 6E (IEEE 802.11ax) standard.

Extremely Fast

In order to achieve this measurement requirements of the ETSI standards the sampling speed of the RadiPower[®] power sensor has been increased to maximum 5 MS/s. The RPR3006W and RPR3008W is also equipped with a hardware trigger input/output that allows synchronous power measurements of wideband data transmission devices with multiple inputs/outputs (MIMO).

Accurate

Next to speed, accuracy is another main requirement when performing RF power measurements of wireless devices. The RPR3006W and RPR3008W allows high precision RF power measurements with a high dynamic range of 60 dB. The power meter provides a accuracy of $\pm 0,2$ dB and is well within the requirements for measurements in accordance to ETSI standards.

Easy to use

The RadiPower[®] Wireless is equipped with an USB interface which enables direct connection of the Power sensors to a PC USB port. Together with the RadiPower USB power sensor a RadiMation[®] FREE freeware package is delivered to enable direct control of the power meter settings and display the measurement results on the PC screen. The RadiMation[®] Freeware also enables synchronous triggering of multiple RadiPower[®] Wireless power sensors.

'Burst' mode

The RadiMation[®] Freeware includes a 'Burst' mode with user selectable measurement speed/time to capture the wideband Burst/Pulse signals and calculate the measurement parameters, maximum RMS power, duty cycle, medium utilization and maximum sequence time. This mode is fully compliant with the measurement methods as defined in the ETSI standards for wideband data transmission systems EN 300 328 (2,4 GHz) and EN 301 893 (5 GHz). In burst mode, the RadiPower can store the information of 100.000 bursts and observation time up to 60 seconds. For each burst the average power and timing data is stored in the buffer. The RadiPower[®] uses a sample speed of 1 or 5 MSps in combination with a RMS detector to ensure correct measurements on wideband modulating transceivers.

Synchronized measurements

For MIMO devices with for example six antenna ports, an equal amount of RPR3006W power heads can be daisy-chained using the MMCX connectors enabling synchronised triggering of all six RadiPower meters. RadiMation Freeware captures the samples of each power meter simultaneously and calculates the total combined power according to the ETSI 300 328 standard.

Software support

The standard delivered RadiMation[®] Freeware supports all RadiPower[®] measurement modes. Using the instrument command codes the RadiPower[®] Wireless can be used with any other software control package.

RadiPower® Technical Specifications

Model	RPR3006W	RPR3008W
Measuring function	RMS power, peak max hold and Burst mode	
Measurement speed	10, 50, 100 kS/s, 1, 5, 10, 20, 33 MS/s ⁽¹⁾	
Storage capacity	100.000 samples 100.000 bursts	
Resolution	0,01 dB	
Measuring units	dBm or Watt	
Zero adjustment	Not required	
Input damage level	> +20 dBm	
Measurement range & accuracy		
Frequency range	10 MHz tot 6 GHz	10 MHz tot 8 GHz
Power measuring range	-50 dBm to +10 dBm @ 10 MHz to 6 GHz	-50 dBm to +10 dBm @ 10 MHz to 6 GHz -40 dBm to +10 dBm @ 6 GHz to 8 GHz
Frequency response accuracy (at 23° C ± 2° C)	+/- 0,2 dB	
Linearity error	0,05 dB + 0,005 dB/dB	
Temperature effect	0,15 dB max over full temperature range	
Deviation from CW for signals with high Crest factor	< 0,2 dB	
VSWR		
Max SWR: < 100 MHz	1,10	
100 MHz to 1 GHz	1,10	
1 GHz to 6 GHz	1,15 typical (max 1,18)	
Connections & Dimensions		
Dimensions of measuring device	124 * 32 * 32 mm	
RF input connector	N type precision	
Data connector (power head side)	USB mini type B	
Power Consumption		
Supply voltage	+5Vdc from USB port (4,75 V to 5,25 V)	
Current consumption (USB)	Max. 250 mA	
Environmental conditions		
Temperature range (operating)	0° to 40° Celsius	
Temperature range (storage)	-20 to 85° C	
Relative humidity	10 - 90% (non-condensing)	
Compliance		
EMC	EN 61326	
Low Voltage	N/A	
Warranty	3 year after product registration (misuse excluded)*	

- In burst mode only 1 and 5 MS/s can be set and used.
- All specifications are measured after 10 minutes warm-up time and 0dBm unless specified otherwise.
- Typical specifications indicate that the measured values are met on at least 80% of the points.
- Three years warranty will be granted only after you register the product at www.raditeq.com. Without registration, an 1 year warranty period applies.

For more information about the current and new Raditeq products at:

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