Boonton

Data Sheet

RTP4000
Real-Time True Average Power Sensors

Key Features

- Real-Time Power Processing™ technology for virtually no gaps in signal acquisition and zero measurement latency
- Synchronized multi-channel measurements
- Power Analyzer advanced measurement and analysis software

Key Specifications

- Frequency range: 4 kHz to 18 GHz
- Measurement range: -60 dBm to +20 dBm
- Measurement speed: 100,000 per second

True average measurements with virtually no modulation bandwidth limitations

Real-Time Power Processing™

Real-Time Power Processing™ (RTPP) technology is a unique parallel processing methodology that performs the multi-step process of RF power measurement at incredible, unmatched speeds. While conventional power meters and USB sensors perform steps serially, resulting in long re-arm times and missed data, Boonton sensors with Real-Time Power Processing™ capture, display and measure every pulse, glitch and detail with no gaps in data and zero latency.

Measurement Buffer Mode

The RTP series Measurement Buffer mode is a remote-control function that works in conjunction with Real-Time Power Processing™ to provide only the relevant burst or pulse information, eliminating the need to download and post-process large sample buffers. As a result, users can collect and analyze measurements from a virtually unlimited number of consecutive pulses or events. A wide variety of parameters can be calculated and plotted, such as duty cycle, pulse repetition rate, pulse width variation, and pulse jitter. In addition, anomalies, such as dropouts, can be identified.

Specifications	RTP4006	RTP4106	RTP4018	RTP4118
RF Frequency Range	10 MHz to 6 GHz	4 kHz to 6 GHz	10 MHz to 18 GHz	4 kHz to 18 GHz
Dynamic Range				
Average	-60 to +20 dBm	-60 to +20 dBm	-60 to +20 dBm	-60 to +20 dBm
Pulse	-45 to +20 dBm	-45 to +20 dBm	-45 to +20 dBm	-45 to +20 dBm
Internal Trigger Range	-40 to +20 dBm	-40 to +20 dBm	-40 to +20 dBm	-40 to +20 dBm
Min Pulse Width	4 µs	4 µs	4 µs	4 µs
Max Repetition Rate	120 kHz	120 kHz	120 kHz	120 kHz
Rise time (fast/std) [1 2]	2 µs / 1 ms	2 µs / 1 ms	2 µs / 1 ms	2 µs / 1 ms
RF Input	Type N, 50 Ω	Type N, 50 Ω	Type N [3], 50 Ω	Type N [3], 50 Ω
VSWR	1.15 (0.01 GHz to 2.0 GHz)	1.15 (0.01 GHz to 2.0 GHz)	1.15 (0.01 GHz to 2.0 GHz)	1.15 (0.01 GHz to 2.0 GHz)
	1.20 (2.0 GHz to 5.0 GHz)	1.20 (2.0 GHz to 5.0 GHz)	1.25 (2.0 GHz to 12.4 GHz)	1.25 (2.0 GHz to 12.4 GHz)
	1.23 (5.0 GHz to 6.0 GHz)	1.23 (5.0 GHz to 6.0 GHz)	1.35 (12.4 GHz to 16.0 GHz)	1.35 (12.4 GHz to 16.0 GHz)
			1.45 (16.0 GHz to 18.0 GHz)	1.45 (16.0 GHz to 18.0 GHz)

1 In High Sensitivity Mode, the RTP4000 sensors change to Standard Bandwidth Mode automatically - video bandwidth changes to 350 Hz.

2 At frequencies < 1MHz, the RTP4106 and RTP4118 changes to High Sensitivity Mode (from fast to standard rise time) automatically.

3 SMA versions also available

Series Specifications

Sampling Techniques	Real-time / Equivalent Time
Continuous sample rate	25 MHz
Effective sample rate	1 GHz

Time Base

Time Base Range	50 ns / div to 50 ms / div (pulse mode)
Time Base Accuracy	+/- 25 ppm
Time Base Resolution	1 ns (RIS mode)
	40 ns (Single-sweep)

Triggers

Trigger Sources	Internal (applied RF), External TTL, Crossover (from another sensor)
Trigger Modes	Single, Normal, AutoTrig, AutoLevel, Free Run
Trigger Slope	Positive or negative
Trigger Delay	
Range	-600 to 1000 ms (timebase dependent)
Resolution	0.02 divisions
Trigger Holdoff (arming control)	
Modes	Off, Holdoff, Gap (frame) arming
Range	1 µs to 1000 ms
Resolution	50 ns
Trigger Jitter	≤ 20 ns rms
Trigger Latency	< 100 ns
External Trigger	
Logic Thresholds	High: > 2.4 V, Low: < 0.7 V
Maximum Input Range	-0.1 V to 5.1 V
Input Impedance	10 kOhms
Minimum Pulse Width	100 ns
Maximum Repetition Rate	2 MHz

Time Base

Trace Acquisition Speed	> 100,000 triggered sweeps / s
Measurement Speed over USB	
Triggered or Free-run	100,000 readings / s (buffered mode)
Continuous Query/Response	1000 measurements / s

Interface

Connectivity	
Data Interface	USB 2.0 Hi-Speed
Device Type	USB High-Power device, bus powered
Current draw	500 mA max (480 mA typical)
Connector	Type B, locking
Multi-I/O	
Connector type	SMB female
Input Modes	Ext Trig, Crossover Slave, Analog
Output Modes	Timebase ref, Sweep, Trig Threshold, Crossover Master, Status
Software Interface	
Application Programming Interface	Windows DLL
Graphical User Interface	Boonton Power Analyzer™ software
Supported Operating Systems	Windows 10
System Hardware Requirements	
Processor	1.3 GHz or higher recommended
RAM	512 MB (1 GB or more recommended)
Hard Disk Space	Min 1.0 GB free space to install or run
Display Resolution	800 x 600 (1280 x 1024 or higher recommended)

Power Analyzer™ Software

Display Types	
Trace (power vs time)	Meter (numeric display)
Automatic measurements (pulse / multiple pulse analysis, marker measurements)	
Marker Measurements (in Trace View)	
Markers (vertical cursors)	Settable in time relative to the trigger position
Marker Independently	Power at specified time
Pair of Markers:	
Min and max power between markers and ratio or average power between them.	
Ref Lines (horizontal cursors)	Settable in power
Automatic Tracking -	
Intersection of either marker and the waveform. Either marker and pulse distal, mesial or proximal levels.	

Operational Requirements

Tests performed per MIL-28800F (Class3)

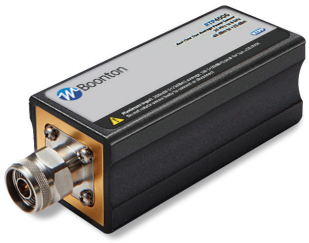
Operating Temperature	0 C to 55 C
Storage Temperature	-40 C to +70 C
Relative Humidity (non-condensing)	< 45 % at 50 C
	< 75 % at 40 C
	< 95 % at 30 C
Altitude	3048 m max
Shock	30 g half-sine, 11 ms duration
Vibration	Sinusoidal: 5 Hz to 55 Hz, 3 g max
	Random: 10 Hz to 500 Hz, 2.34 g rms
	Power Spectral Density: 0.01 g2 / Hz

Regulatory Compliance

Class A Equipment	
European Union	EMC Directive 2014/30/EU, EN 61326:2013, Low Voltage Directive 2014/35/EU, EN 61010-1:2010 / A1:2019 RoHS 3 Directive 2015/863/EU
Australia and New Zealand	RCM AS/NZS 4417:2012

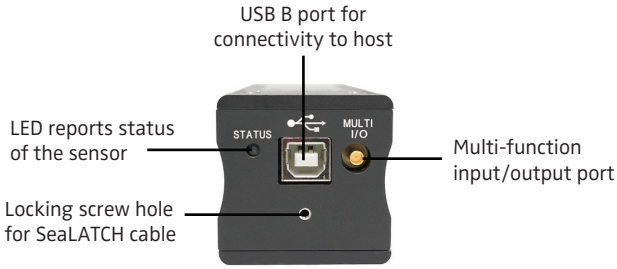
General Characteristics

Power Consumption	2.5W max (USB High-Power device)
Dimensions (HxWxD)	1.7″ x 1.7″ x 5.6″ RTP4x06; 1.7″ x 1.7″ x 5.75″ RTP4x18
Excluding RF Connector	(4.3 cm x 4.3 cm x 14.2 cm) (4.3 cm x 4.3 cm x 14.6 cm)
Weight	0.8 lbs (0.36 kg)
Warranty	3 years



RTP4006 and RTP4106

RTP4018-S/1 and RTP4118-S/1



Ordering Information

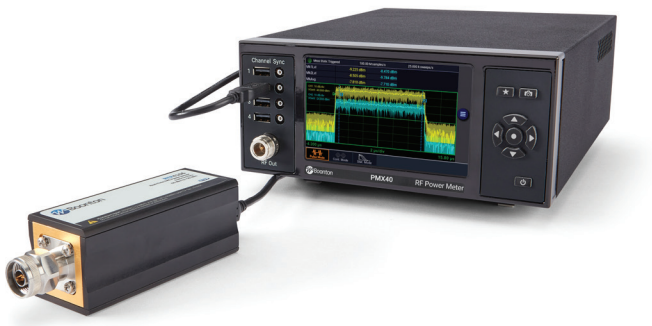
RTP4006	Real-Time True Average Power Sensor 10 MHz to 6 GHz
RTP4106	Real-Time True Average Power Sensor 4 kHz to 8 GHz
RTP4018	Real-Time True Average Power Sensor 10 MHz to 18 GHz (-S/1 replaces N-type with an SMA connector)
RTP4118	Real-Time True Average Power Sensor 4 kHz to 18 GHz (-S/1 replaces N-type with an SMA connector)

Included Accessories

84620400A	Information Card
57500800A	0.9 m BNC (m) to SMB (m) cable
57500900A	0.9 m SMB (m) to SMB (m) cable
57401000A	1.8 m USB A (m) to USB B (m) locking SeaLATCH cable

xxx = 006, 008, 318, 518, 340, or 540

Compatible with **PMX40 RF Power Meter** for benchtop operation.



Wireless Telecom Group

Wireless Telecom Group Inc.
25 Eastmans Rd
Parsippany, NJ 07054
United States
Tel: +1 973 386 9696
Fax: +1 973 386 9191
www.boonton.com

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