

The Secret is the Sensors

Giga-tronics power meter architecture provides for a broad choice of functional sensors. Just by changing a sensor, you can measure CW power, pulse power, and the peak and average power of TDMA, GSM and CDMA signals faster, more accurately, and over a wider range.



THE FASTEST CW MEASUREMENTS

Giga-tronics 80300A Series CW Power Sensors let you measure CW power from 10 MHz to 40 GHz at more than 1,750 readings per second over GPIB.

Measure up to 90 dB with a single sensor, and select from a variety of high power sensors, up to 50 W.

PULSE POWER MEASUREMENTS

Attach a Giga-tronics 80350A Series Peak Power Sensor to an 8650A meter and directly measure the instantaneous peak power level of a pulse modulated signal.

Use the 'sample delay' function to set the desired measurement point on the waveform. And an external scope can be used to view the profile and see the exact measurement point on the pulse.



Sensor Measurement Capabilities					
Signal Type	Sensor Model				
	80301A	80350A	80401A	80601A	80701A
CW Power Level	-70 to +20 dBm	-30 to +20 dBm	-67 to +20 dBm	-67 to +20 dBm	-64 to +20 dBm
Amplitude Modulation Rate, Power Range	N/A	N/A	$f_m \leq 40$ kHz, -60 to +20 dBm $f_m > 40$ kHz, -60 to -20 dBm	$f_m \leq 1.5$ MHz, -60 to +20 dBm $f_m > 1.5$ MHz, -60 to -20 dBm	$f_m \leq 10$ MHz, -60 to +20 dBm
Two-Tone Maximum Separation Between Carriers	N/A	N/A	≤ 40 kHz, -60 to +20 dBm > 40 kHz, -60 to -20 dBm	≤ 1.5 MHz, -60 to +20 dBm > 1.5 MHz, -60 to -20 dBm	≤ 10 MHz, -60 to +20 dBm > 10 MHz, -60 to -20 dBm
Pulse Modulation	N/A	> 350 ns Pulse Width	> 200 μ s Pulse Width	> 300 μ s Pulse Width	> 100 μ s Pulse Width
Burst with Modulation <small>f_m = modulation rate</small>	N/A	N/A	$f_m \leq 40$ kHz, > 200 μ s Pulse Width; -40 to +20 dBm $f_m > 40$ kHz, > 200 μ s Pulse Width; -40 to -20 dBm	$f_m \leq 1.5$ MHz, > 300 μ s Pulse Width; -40 to +20 dBm $f_m > 1.5$ MHz, > 300 μ s Pulse Width; -40 to -20 dBm	$f_m \leq 10$ MHz, > 100 μ s Pulse Width; -30 to +20 dBm $f_m > 10$ MHz, > 100 μ s Pulse Width; -30 to -20 dBm

MODULATED POWER MEASUREMENTS

The Giga-tronics 80400A Series Modulated Power Sensors let you measure the average power of amplitude modulated, burst modulated and other complex modulated signals — such



as TDMA signals — at bandwidths up to 40 kHz.

The Giga-tronics 80600A Series Modulated Power Sensors provide bandwidth up to 1.5 MHz to measure the peak and average power of CDMA signals.



And the Giga-tronics 80701A Modulated Power Sensor operating with the 8650A power meter, provides system bandwidth up to 10 MHz to measure the peak and average power of wide band, third-generation CDMA signals over an 80 dB range.



Giga-tronics CW Power Sensor Selection Guide

	Frequency Range/ Power Range	Maximum Power	Power Linearity ¹ (Frequency > 8 GHz)	RF Connector	Length	Diameter	Weight	VSWR
200 mW CW Power Sensors								
80301A	10 MHz to 18 GHz -70 to +20 dBm	+23 dBm (200 mW)	-70 to -20 dBm: ±0.00 dB -20 to +20 dBm: ±0.05 dB/10 dB	Type N(m) 50Ω	114.5 mm (4.5 in)	32 mm (1.25 in)	0.18 kg (0.4 lb)	1.12: 0.01 - 2 GHz 1.22: 2 - 12.4 GHz
80302A	10 MHz to 18 GHz -70 to +20 dBm	+23 dBm (200 mW)	-70 to -20 dBm: ±0.00 dB -20 to +20 dBm: ±0.05 dB/10 dB	APC-7 50Ω	114.5 mm (4.5 in)	32 mm (1.25 in)	0.18 kg (0.4 lb)	1.29: 12.4 - 18 GHz
80303A	10 MHz to 26.5 GHz -70 to +20 dBm	+23 dBm (200 mW)	-70 to -20 dBm: ±0.00 dB -20 to +20 dBm: ±0.1 dB/10 dB	Type K(m) ¹ 50Ω	114.5 mm (4.5 in)	32 mm (1.25 in)	0.18 kg (0.4 lb)	1.12: 0.01 - 2 GHz 1.22: 2 - 12.4 GHz
80304A	10 MHz to 40 GHz -70 to 0 dBm	+23 dBm (200 mW)	-70 to -20 dBm: ±0.00 dB -20 to 0 dBm: ±0.2 dB/10 dB	Type K(m) ¹ 50Ω	114.5 mm (4.5 in)	32 mm (1.25 in)	0.18 kg (0.4 lb)	1.38: 12.4 - 18 GHz 1.43: 18 - 26.5 GHz 1.92: 26.5 - 40 GHz
Low VSWR CW Power Sensors								
80310A	10 MHz to 18 GHz -64 to +26 dBm	+29 dBm (800 mW)	-64 to -14 dBm: ±0.00 dB -14 to +26 dBm: ±0.05 dB/10 dB	Type K(m) ¹ 50Ω	127 mm (5.0 in)	32 mm (1.25 in)	0.23 kg (0.5 lb)	1.13: 0.01 - 2 GHz 1.16: 2 - 12 GHz
80313A	10 MHz to 26.5 GHz -64 to +26 dBm	+29 dBm (800 mW)	-64 to -14 dBm: ±0.00 dB -14 to +26 dBm: ±0.1 dB/10 dB					1.23: 12 - 18 GHz 1.29: 18 - 26.5 GHz
80314A	10 MHz to 40 GHz -64 to +6 dBm	+29 dBm (800 mW)	-64 to -14 dBm: ±0.00 dB -14 to +6 dBm: ±0.2 dB/10 dB					1.50: 26.5 - 40 GHz
1 W CW Power Sensors								
80320A	10 MHz to 18 GHz -60 to +30 dBm	+30 dBm (1 W)	-60 to -10 dBm: ±0.00 dB -10 to +30 dBm: ±0.05 dB/10 dB	Type K(m) ¹ 50Ω	127 mm (5.0 in)	32 mm (1.25 in)	0.23 kg (0.5 lb)	1.11: 0.01 - 2 GHz 1.12: 2 - 12 GHz
80323A	10 MHz to 26.5 GHz -60 to +30 dBm	+30 dBm (1 W)	-60 to -10 dBm: ±0.00 dB -10 to +30 dBm: ±0.1 dB/10 dB					1.18: 12 - 18 GHz 1.22: 18 - 26.5 GHz
80324A	10 MHz to 40 GHz -60 to +10 dBm	+30 dBm (1 W)	-60 to -10 dBm: ±0.00 dB -10 to +10 dBm: ±0.2 dB/10 dB					1.36: 26.5 - 40 GHz
5 W CW Power Sensor ²								
80321A	10 MHz to 18 GHz -50 to +37 dBm	+37 dBm (5 W)	-50 to 0 dBm: ±0.00 dB 0 to +37 dBm: ±0.05 dB/10 dB	Type N(m) 50Ω	150 mm (5.9 in)	32 mm (1.25 in)	0.23 kg (0.5 lb)	1.20: 0.01 - 6 GHz 1.25: 6 - 12.4 GHz 1.35: 12.4 - 18 GHz
25 W CW Power Sensor ³								
80322A	10 MHz to 18 GHz -40 to +44 dBm	+44 dBm (25 W)	-40 to +10 dBm: ±0.00 dB +10 to +44 dBm: ±0.05 dB/10 dB	Type N(m) 50Ω	230 mm (9.0 in)	104 mm (4.1 in)	0.3 kg (0.6 lb)	1.20: 0.01 - 6 GHz 1.30: 6 - 12.4 GHz 1.40: 12.4 - 18 GHz
50 W CW Power Sensor ³								
80325A	10 MHz to 18 GHz -40 to +47 dBm	+47 dBm (50 W)	-40 to +10 dBm: ±0.00 dB +10 to +47 dBm: ±0.05 dB/10 dB	Type N(m) 50Ω	230 mm (9.0 in)	104 mm (4.1 in)	0.3 kg (0.6 lb)	1.25: 0.01 - 6 GHz 1.35: 6 - 12.4 GHz 1.45: 12.4 - 18 GHz

Giga-tronics Peak Power Sensor Selection Guide

	Frequency Range/ Power Range	Maximum Power	Power Linearity ¹ (Frequency > 8 GHz)	RF Connector	Length	Diameter	Weight	VSWR
200 mW Peak Power Sensors								
80350A	45 MHz to 18 GHz -20 to +20 dBm, Peak -30 to +20 dBm, CW	+23 dBm (200 mW) CW or Peak	-30 to -20 dBm: ±0.00 dB -20 to +20 dBm: ±0.05 dB/10 dB	Type N(m) 50Ω	165 mm (6.5 in)	37 mm (1.25 in)	0.3 kg (0.7 lb)	1.12: 0.045 - 2 GHz 1.22: 2 - 12.4 GHz 1.37: 12.4 - 18 GHz
80353A	45 MHz to 26.5 GHz -20 to +20 dBm, Peak -30 to +20 dBm, CW	+23 dBm (200 mW) CW or Peak	-30 to -20 dBm: ±0.00 dB -20 to +20 dBm: ±0.1 dB/10 dB	Type K(m) ¹ 50Ω	165 mm (6.5 in)	37 mm (1.25 in)	0.3 kg (0.7 lb)	1.50: 18 - 26.5 GHz 1.92: 26.5 - 40 GHz
80354A	45 MHz to 40 GHz -20 to +0.0 dBm, Peak -30 to +0.0 dBm, CW	+23 dBm (200 mW) CW or Peak	-30 to -20 dBm: ±0.00 dB -20 to 0.0 dBm: ±0.2 dB/10 dB	Type K(m) ¹ 50Ω	165 mm (6.5 in)	37 mm (1.25 in)	0.3 kg (0.7 lb)	
5 W Peak Power Sensor ^{5,7}								
80351A	45 MHz to 18 GHz 0 to +40 dBm, Peak -10 to +37 dBm, CW	CW: +37 dBm (5 W Average) Peak: +43 dBm	-10 to +0 dBm: ±0.00 dB 0.0 to +40 dBm: ±0.05 dB/10 dB	Type N(m) 50Ω	200 mm (7.9 in)	37 mm (1.25 in)	0.3 kg (0.7 lb)	1.15: 0.045 - 4 GHz 1.25: 4 - 12.4 GHz 1.35: 12.4 - 18 GHz
25 W Peak Power Sensor ^{6,7}								
80352A	45 MHz to 18 GHz +10 to +50 dBm, Peak 0.0 to +44 dBm, CW	CW: +44 dBm (25 W Average) Peak: +53 dBm	0.0 to +10 dBm: ±0.00 dB +10 to +50 dBm: ±0.05 dB/10 dB	Type N(m) 50Ω	280 mm (11.0 in)	104 mm (4.1 in)	0.3 kg (0.7 lb)	1.20: 0.045 - 6 GHz 1.30: 6 - 12.4 GHz 1.40: 12.4 - 18 GHz
50 W Peak Power Sensor ^{6,7}								
80355A	45 MHz to 18 GHz +10 to +50 dBm, Peak 0.0 to +47 dBm, CW	CW: +47 dBm (50 W Average) Peak: +53 dBm	0.0 to +10 dBm: ±0.00 dB +10 to +50 dBm: ±0.05 dB/10 dB	Type N(m) 50Ω	280 mm (11.0 in)	104 mm (4.1 in)	0.3 kg (0.7 lb)	1.25: 0.045 - 6 GHz 1.35: 6 - 12.4 GHz 1.45: 12.4 - 18 GHz

Giga-tronics Bridge Selection Guide

	Frequency Range/ Power Range	Maximum Power	Power Linearity ⁴ (Frequency > 8 GHz)	Input	Test Port	Directivity	Weight	VSWR
Precision CW Return Loss Bridges								
80501	10 MHz to 18 GHz -35 to +20 dBm	+27 dBm (0.5 W)	-35 to +10 dBm: ±0.1 dB +10 to +20 dBm: ±0.1 dB ±0.005 dB/dB	Type N(f) 50Ω	Type N(f) 50Ω	38 dB	0.340 kg	< 1.17: 0.01 - 8 GHz < 1.27: 8 - 18 GHz
80502	10 MHz to 18 GHz -35 to +20 dBm	+27 dBm (0.5 W)	-35 to +10 dBm: ±0.1 dB +10 to +20 dBm: ±0.1 dB ±0.005 dB/dB	Type N(f) 50Ω	APC-7(f) 50Ω	40 dB	0.340 kg	< 1.13: 0.01 - 8 GHz < 1.22: 8 - 18 GHz
80503	10 MHz to 26.5 GHz -35 to +20 dBm	+27 dBm (0.5 W)	-35 to +10 dBm: ±0.1 dB +10 to +20 dBm: ±0.1 dB ±0.005 dB/dB	SMA(f) 50Ω	SMA(f)	35 dB	0.340 kg	< 1.22: 0.01 - 18 GHz < 1.27: 18 - 26.5 GHz
80504	10 MHz to 40 GHz -35 to +20 dBm	+27 dBm (0.5 W)	-35 to +10 dBm: ±0.1 dB +10 to +20 dBm: ±0.1 dB ±0.005 dB/dB	Type K(f) 50Ω	Type K(f) 50Ω	30 dB	0.198 kg	< 1.35: 0.01 - 26.5 GHz < 1.44: 26.5 - 40 GHz

Giga-tronics Modulation Power Sensor Selection Guide ($f_m \leq 40$ kHz)

	Frequency Range/ Power Range	Maximum Power	Power Linearity ¹ (Frequency > 8 GHz)	RF Connector	Length	Diameter	Weight	VSWR
200 mW Modulation Power Sensors								
80401A	10 MHz to 18 GHz -67 to +20 dBm	+23 dBm (200 mW)	-67 to -20 dBm: ± 0.00 dB -20 to +20 dBm: ± 0.05 dB/10 dB	Type N(m) 50 Ω	114.5 mm (4.5 in)	32 mm (1.25 in)	0.18 kg (0.4 lb)	1.12: 0.01 - 2 GHz 1.22: 2 - 12.4 GHz 1.29: 12.4 - 18 GHz
80402A	10 MHz to 18 GHz -67 to +20 dBm	+23 dBm (200 mW)	-67 to -20 dBm: ± 0.00 dB -20 to +20 dBm: ± 0.05 dB/10 dB	APC-7 50 Ω				
Low VSWR Modulation Power Sensor								
80410A	10 MHz to 18 GHz -64 to +26 dBm	+29 dBm (800 mW)	-64 to -14 dBm: ± 0.00 dB -14 to +26 dBm: ± 0.05 dB/10 dB	Type K ¹ (m) 50 Ω	127 mm (5.0 in)	32 mm (1.25 in)	0.23 kg (0.5 lb)	1.13: 0.01 - 2 GHz 1.16: 2 - 12 GHz 1.23: 12 - 18 GHz
1 W Modulation Power Sensor								
80420A	10 MHz to 18 GHz -57 to +30 dBm	+30 dBm (1 W)	-57 to -10 dBm: ± 0.00 dB -10 to +30 dBm: ± 0.05 dB/10 dB	Type K ¹ (m) 50 Ω	127 mm (5.0 in)	32 mm (1.25 in)	0.23 kg (0.5 lb)	1.11: 0.01 - 2 GHz 1.12: 2 - 12 GHz 1.18: 12 - 18 GHz
5 W Modulation Power Sensor ²								
80421A	10 MHz to 18 GHz -47 to +37 dBm	+37 dBm (5 W)	-47 to 0 dBm: ± 0.00 dB 0 to +37 dBm: ± 0.05 dB/10 dB	Type N(m) 50 Ω	150 mm (5.9 in)	32 mm (1.25 in)	0.23 kg (0.5 lb)	1.20: 0.01 - 6 GHz 1.25: 6 - 12.4 GHz 1.35: 12.4 - 18 GHz
25 W Modulation Power Sensor ³								
80422A	10 MHz to 18 GHz -37 to +44 dBm	+44 dBm (25 W)	-37 to +10 dBm: ± 0.00 dB +10 to +44 dBm: ± 0.05 dB/10 dB	Type N(m) 50 Ω	230 mm (9.0 in)	104 mm (4.1 in)	0.3 kg (0.6 lb)	1.20: 0.01 - 6 GHz 1.30: 6 - 12.4 GHz 1.40: 12.4 - 18 GHz
50 W Modulation Power Sensor ³								
80425A	10 MHz to 18 GHz -34 to +47 dBm	+47 dBm (50 W)	-34 to +10 dBm: ± 0.00 dB +10 to +47 dBm: ± 0.05 dB/10 dB	Type N(m) 50 Ω	230 mm (9.0 in)	104 mm (4.1 in)	0.3 kg (0.6 lb)	1.25: 0.01 - 6 GHz 1.35: 6 - 12.4 GHz 1.45: 12.4 - 18 GHz

Giga-tronics Modulation Power Sensor Selection Guide ($f_m \leq 1.5$ MHz)

	Frequency Range/ Power Range	Maximum Power	Power Linearity ¹ (Frequency > 8 GHz)	RF Connector	Length	Diameter	Weight	VSWR
200 mW Modulation Power Sensors								
80601A	10 MHz to 18 GHz -67 to +20 dBm, CW	+23 dBm (200 mW)	-67 to -20 dBm: ± 0.00 dB -20 to +20 dBm: ± 0.05 dB/10 dB	Type N(m) 50 Ω	137 mm (5.39 in)	41 mm (1.62 in)	0.23 kg (0.5 lb)	1.12: 0.01 - 2 GHz 1.22: 2 - 12.4 GHz 1.29: 12.4 - 18 GHz
5 W Modulation Power Sensor ^{5,7}								
80621A	10 MHz to 18 GHz -47 to +37 dBm	+37 dBm (5 W)	-47 to 0 dBm: ± 0.00 dB 0 to +37 dBm: ± 0.05 dB/10 dB	Type N(m) 50 Ω	175 mm (6.90 in)	41 mm (1.62 in)	0.28 kg (0.6 lb)	1.20: 0.01 - 6 GHz 1.25: 6 - 12.4 GHz 1.35: 12.4 - 18 GHz

Giga-tronics Modulation Power Sensor Selection Guide ($f_m \leq 10$ MHz)

	Frequency Range/ Power Range	Maximum Power	Power Linearity ¹	RF Connector	Length	Diameter	Weight	VSWR
200 mW Modulation Power Sensor								
80701A (Requires Option 12)	50 MHz to 18 GHz -64 to +20 dBm, CW 250 MHz to 18 GHz -60 to +20 dBm, Modulation	+23 dBm (200 mW)	Frequency > 8 GHz -60 to -20 dBm: ± 0.00 dB -20 to +20 dBm: ± 0.05 dB/10 dB Frequency < 500 MHz -60 to -20 dBm: ± 0.00 dB -20 to +20 dBm: ± 0.05 dB/10 dB	Type N(m) 50 Ω	120 mm (4.72 in)	27 mm (1.06 in)	0.10 kg (0.2 lb)	1.12: 0.01 - 2 GHz 1.22: 2 - 12.4 GHz 1.29: 12.4 - 18 GHz

Giga-tronics True RMS Sensors Selection Guide ($f_m > 1.5$ MHz)

	Frequency Range/ Power Range	Maximum Power	Power Linearity ¹ (Frequency > 8 GHz)	RF Connector	Length	Diameter	Weight	VSWR
True RMS Sensors (-30 dBm to +20 dBm)								
80330A	10 MHz to 18 GHz	+33 dBm (2 W)	-30 to +20 dBm: ± 0.00 dB	Type K(m) ¹ 50 Ω	152 mm (6.0 in)	32 mm (1.25 in)	0.27 kg (0.6 lb)	1.12: 0.01 - 12 GHz 1.15: 12 - 18 GHz 1.18: 18 - 26.5 GHz 1.29: 26.5 - 40 GHz
80333A	10 MHz to 26.5 GHz							
80334A	10 MHz to 40 GHz							

Sensor Calibration Factor Uncertainties

Frequency (GHz)	Root Sum of Squares (RSS) Uncertainties(%) ⁸								
		80301A				80321A ⁹			
		80302A				80322A ⁹			
		80350A				80325A ⁹			
		80401A	80303A	80310A	80320A	80421A ⁹			
		80402A	80304A	80313A	80323A	80422A ⁹	80330A	80351A ⁹	
		80601A	80353A	80314A	80324A	80425A ⁹	80333A	80352A ⁹	
Lower	Upper	80701A	80354A	80410A	80420A	80621A ⁹	80334A	80355A ⁹	
Min	1	1.04	1.64	1.58	1.58	4.54	1.58	4.92	
1	2	1.20	1.73	1.73	1.73	4.67	1.73	5.04	
2	4	1.33	1.93	1.91	1.91	4.89	1.90	7.09	
4	6	1.41	2.03	2.02	2.01	5.01	2.01	7.17	
6	8	1.52	2.08	2.07	2.06	5.12	2.06	7.25	
8	12.4	1.92	2.55	2.54	2.53	5.56	2.53	7.56	
12.4	18	2.11	2.83	2.80	2.79	5.89	2.78	12.37	
18	26.5	—	3.63	3.68	3.62	—	3.59	—	
26.5	40	—	6.05	5.54	5.39	—	5.30	—	

¹ The K connector is electrically and mechanically compatible with the APC-3.5 and SMA connectors. Note: Use a Type N(m) to SMA(f) adapter (part no. 29835) for calibration of power sensors with Type K(m) connectors. ² Power coefficient equals <0.01 dB/Watt. ³ Power coefficient equals <0.015 dB/Watt. ⁴ For frequencies above 8 GHz, add power linearity to system linearity. ⁵ Power coefficient equals <0.01 dB/Watt (Average). ⁶ Power coefficient equals <0.015 dB/Watt (Average). ⁷ Peak operating range above CW maximum range is limited to <10% duty cycle. ⁸ Square root of the sum of the individual uncertainties squared (RSS). ⁹ Cal Factor numbers allow for 3% repeatability when reconnecting an attenuator to a sensor and 3% for attenuator measurement uncertainty and mismatch of sensor/pad combination.