1-15. SPECIFICATIONS.

1-16. Performance specifications are listed in Table 1-1.

1-17. OUTLINE DIMENSIONS.

1-18. Outline dimensions of the instrument are shown in Figure 1-2.

TABLE 1-1. SENSOR CHARACTERISTICS

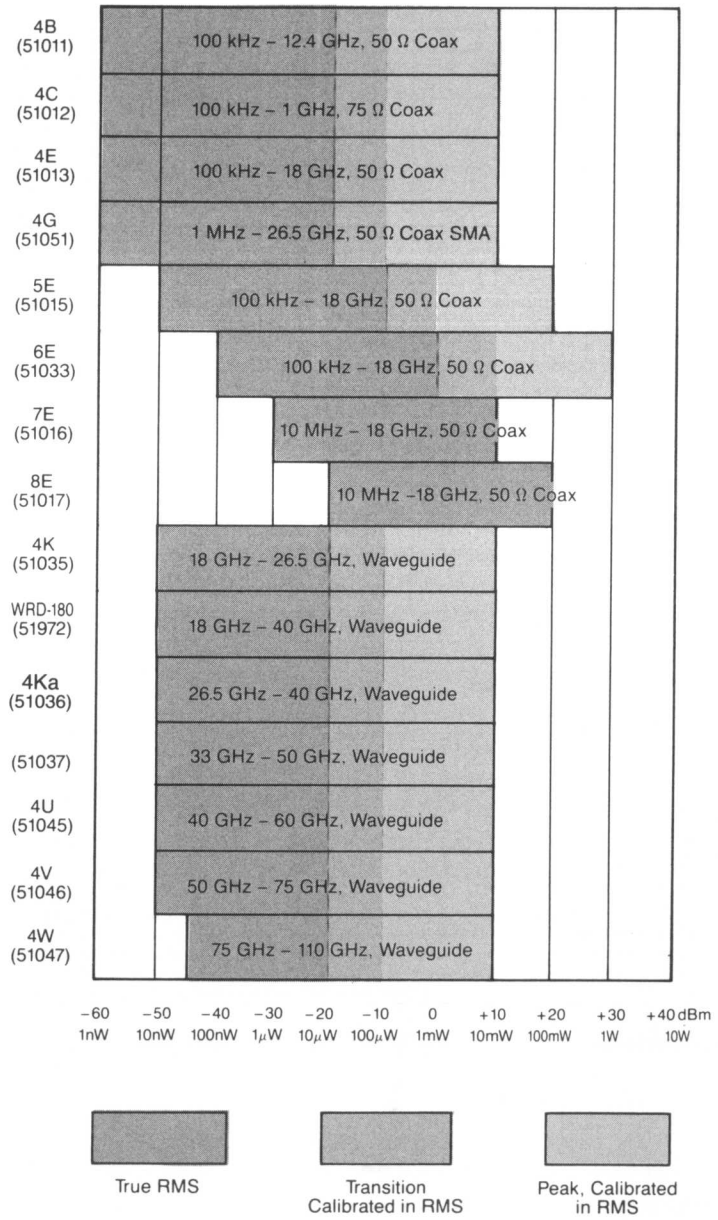

TABLE 1-1. PERFORMANCE SPECIFICATIONS (Cont.)

Parameter	Specifications
RANGING	Autoranging plus hold on range
BASIC MEASUREMENT ACCURACY The total accuracy of the Model 4200 system, including sensor, is the sum of the uncertainties noted in sections A, B, C and D. These uncertainties may also be added in an RSS fashion which represents the most probable total uncertainty. $RSS = (A^2 + B^2 + C^2 + D^2)^{1/2}$ When operated as a dual-channel instrument (option – 03), total uncertainties of A must be multiplied by a factor of two.	A. Basic Uncertainty (includes all instrumentation, noise, zero, and shaping errors and includes 0.7% power reference setting error)

Sensor	Input Level	Uncertainty Power	Uncertainty dBm
4B/C/E/G	>10 nW	1.2% rdg ± 0.1% fs	see curves below
	<10 nW	1.5% rdg ± 1.5% fs	
5E	>100 nW	1.2% rdg ± 0.1% fs	
	<100 nW	1.5% rdg ± 1.5% fs	
6E	>1 μW	1.2% rdg ± 0.1% fs	
	<1 μW	1.5% rdg ± 1.5% fs	
7E	>10 μW	1.2% rdg ± 0.1% fs	
	<10 μW	1.0% rdg ± 3.0% fs	
8E	>100 μW	1.2% rdg ± 0.1% fs	
	<100 μW	1.0% rdg ± 3.0% fs	
4K	10 μW (−20 dBm) at 22 GHz	± 6% rdg	± 0.25*
4KA	10 μW (−20 dBm) at 33 GHz	± 13% rdg	± 0.50*
4Q	10 μW (−20 dBm) at 40 GHz	± 13% rdg	± 0.50*
4U	10 nW to 10 mW at 40 GHz to 60 GHz	± 6% rdg	± 0.25*
4V	10 nW to 10 mW at 50 GHz to 75 GHz	± 6% rdg	± 0.25*
4W	10 nW to 10 mW at 75 GHz to 110 GHz	± 6% rdg	± 0.25*
WRD180	10 nW to 10 mW at 18 GHz to 40 GHz	± 6% rdg	± 0.25*

* ± 0.01 dB/10 dBm relative to −20 dBm

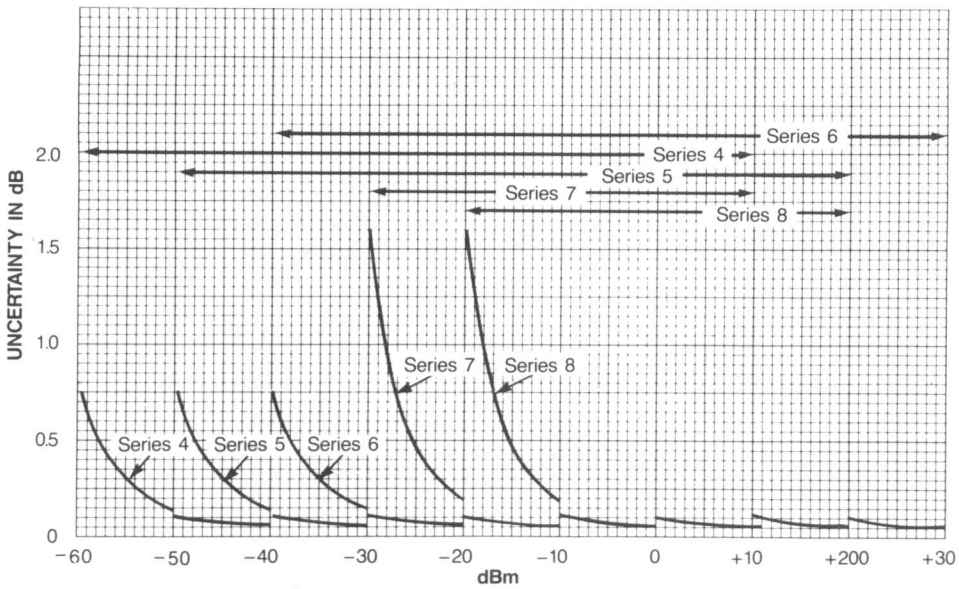

TABLE 1-1. PERFORMANCE SPECIFICATIONS (Cont.)

Parameter	Specifications

B. Temperature Uncertainty (at 1 MHz)

Temperature	Uncertainty Instrument	Uncertainty All Sensors
21° C to 25° C (reference)	0% (0 dB)	0% (0 dB)
18° C to 30° C	0% (0 dB)	±2.32% (± 0.1 dB)
10° C to 40° C	±4.7% (±0.2 dB)	±4.7% (±0.2 dB)
0° C to 55° C	±5% (±0.25 dB)	

C. Calibration Factor Uncertainity

Coaxial Sensor Calibration Factor Uncertainty

Sensor	Frequency GHz																			
	.05*	< 2	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19-26.5
4B (51011)																				
Max. %	0	1.3	3.0	3.0	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.5	4.5							
RSS %	0	1.3	1.7	1.7	1.7	1.8	1.9	2.0	2.1	2.5	2.5	2.4	3.0							
4C (51012)																				
Max. %	0	1.3																		
RSS %	0	1.3																		
4E (51013)																				
Max. %	0	1.3	3.0	3.0	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.5	4.5	6.0	6.0	6.0	6.0	6.0	6.0	
RSS %	0	1.3	1.8	1.8	1.8	1.9	2.0	2.0	2.2	2.6	2.5	2.7	3.0	3.4	3.1	3.2	3.3	3.1	3.4	
4G (51051)																				
Max. %	0	1.3	3.0	3.0	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0
RSS %	0	1.3	1.7	1.7	1.7	1.7	1.8	1.9	2.0	2.4	2.3	2.2	2.6	3.0	2.8	2.8	2.9	2.8	3.1	3.4
5E (51015)																				
Max. %	0	1.3	3.0	3.0	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.5	6.0	6.0	6.0	6.0	6.0	6.0	
RSS %	0	1.3	1.7	1.7	1.7	1.7	1.8	1.9	2.0	2.4	2.3	2.2	2.8	3.0	2.8	2.8	2.9	2.8	3.1	
6E (51033)																				
Max. %	0	1.3	3.0	3.0	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.5	6.0	6.0	6.0	6.0	6.0	6.0	
RSS %	0	1.3	1.7	1.7	1.7	1.7	1.8	1.9	2.0	2.4	2.3	2.2	2.8	3.0	2.8	2.8	2.9	2.8	3.1	
7E (51016)																				
Max. %	0	1.3	3.0	3.0	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.5	6.0	6.0	6.0	6.0	6.0	6.0	
RSS %	0	1.3	1.8	1.8	1.8	1.8	1.9	2.0	2.1	2.5	2.4	2.6	2.9	3.3	3.1	3.1	3.2	3.0	3.4	
8E (51017)																				
Max. %	0	1.3	3.0	3.0	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0	4.5	6.0	6.0	6.0	6.0	6.0	6.0	
RSS %	0	1.3	1.8	1.8	1.8	1.8	1.9	2.0	2.1	2.5	2.4	2.6	2.9	3.3	3.1	3.1	3.2	3.0	3.4	

* Reference Frequency = 50 MHz. Note: CAL Factors are supplied at every 1 GHz.

Waveguide Sensor Calibration Factor Uncertainty

Sensor	Ref. GHz	At Ref. Freq.	Over Sensor BW	Sensor	Ref. GHz	At Ref. Freq.	Over Sensor BW	Sensor	Ref. GHz	At Ref. Freq.	Over Sensor BW	Sensor	Ref. GHz	At Ref. Freq.	Over Sensor BW
4K (51035)	22			4Q (51037)	40			4V (51046)	60						
Max. %		6	6	Max. %		10	13	Max. %		12	13	WRD-180 (51972)	33		
RSS %		5	5	RSS %		6	7	RSS %		6	9				
4Ka (51036)	33			4U (51045)	40			4W (51047)	94						
Max. %		6	10	Max. %		10	13	Max. %		12	13	Max. %		6	10
RSS %		5	7	RSS %		6	8	RSS %		9	11	RSS %		5	7

Note: For waveguide sensors, the reference calibration is at −20 dBm.

D. Power Reference Uncertainty. Power reference accuracy is ±1.2% worst case for one year (0° to 55° C). When calculating the sum of the uncertainties, only include 0.5% for the power reference as the remaining 0.7% is included in A above.