4950 Specifications

Specifications are ±ppm of reading, valid within the measurement band and within ±1% of all frequencies

Function	Transfer Point [1]	Frequency	Transfer Stability [2] ppm ±1°C TCAL 30 day	90 day	Temperature Coefficient ppm/°C [3]	MTS_CAL [4] calibration uncertainty	CAL_CAL [4] uncertainty [5] [6]
DC Voltage	±100 mV		3	4.2	0.6	4.0	5.0
	±1 V		1.5	2.1	0.5	2.2	2.6
	±10 V		1.5	2.1	0.5	1.4	2.1
	±19 V		1.5	2.1	0.5	1.8	2.3
	±100 V		2	2.8	0.8	2.0	2.9
	±100 V		2	2.8	0.8	2.0	2.9
AC Voltage	1mV, 10mV and 100mV [7]	10 Hz	20 + 2µV	28 + 2µV	1	117	120 + 2µV
		20 Hz	20 + 2µV	28 + 2µV	1	117	120 + 2µV
		30 Hz	20 + 2µV	28 + 2µV	1	117	120 + 2µV
		40 Hz	20 + 2µV	28 + 2µV	1	117	120 + 2µV
		55 Hz	20 + 2µV	28 + 2µV	1	117	120 + 2µV
		300 Hz	20 + 2µV	28 + 2µV	1	89	91 + 2µV
		1 kHz	20 + 2µV	28 + 2µV	1	89	91 + 2µV
		10 kHz	20 + 2µV	28 + 2µV	1	103	105 + 2µV
		20 kHz	20 + 2µV	28 + 2µV	1	117	119 + 2µV
		30 kHz	20 + 2µV	28 + 2µV	1	190	191 + 2µV
		50 kHz	30 + 2µV	42 + 2µV	5	190	192 + 2µV
		100 kHz	50 + 3µV	70 + 3µV	5	356	359 + 3µV
		300 kHz	100 + 3µV	140 + 3µV	5	579	588 + 3µV
		500 kHz	200 + 3µV	280 + 3µV	40	607	639 + 3µV
		1 MHz	300 + 3µV	420 + 3µV	40	945	992 + 3µV
	1V and 10V	10 Hz	10	14	1	36	38
		20 Hz	10	14	1	36	38
		30 Hz	10	14	1	36	38
		40 Hz	10	14	1	24	26
		55 Hz	10	14	1	24	26
		300 Hz	10	14	1	24	26
		1 kHz	10	14	1	24	26
		10 kHz	10	14	1	24	26
		20 kHz	10	14	1	24	26
		30 kHz	10	14	1	26	26
		50 kHz	20	28	5	26	37
		100 kHz	30	42	5	37	47
		300 kHz	70	98	10	96	119
		500 kHz	100	140	40	202	226
		1 MHz	200	280	40	557	591
	19V	1 kHz	10	14	1	24	26
	100V	10 Hz	10	14	2	41	42
		20 Hz	10	14	2	41	42
		30 Hz	10	14	2	41	42
		40 Hz	10	14	2	36	38
		55 Hz	10	14	2	36	38
		300 Hz	10	14	2	26	28
		1 kHz	10	14	2	26	28
		10 kHz	10	14	2	26	28
		20 kHz	10	14	2	26	28
		30 kHz	10	14	2	29	31
		50 kHz	20	28	5	35	40
		100 kHz	30	42	5	64	71
		200 kHz	50	70	10	239	244
	700V	50 kHz	50	70	8	110	121
		100 kHz	50	70	8	344	348
	1000V	55 Hz	15	21	2	37	40
		300 Hz	15	21	2	37	40
		1 kHz	15	21	2	37	40
		10 kHz	15	21	2	42	44
		20 kHz	15	21	2	47	49
		30 kHz	15	21	2	74	75

[1] Measurements within ±10% of band and ±1% of frequency except the 190% bands.
[2] Assumes a successful 4950 transportation loop closure.
[3] Within ±5°C of TCAL.
[4] MTS_CAL & CAL_CAL refer to Wavetek automatic calibration software.

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Function	Transfer Point [1]	Frequency	Transfer Stability [2] ppm ±1°C TCAL 30 day	90 day	Temperature Coefficient ppm/°C [3]	MTS_CAL [4] calibration uncertainty	CAL_CAL [4] uncertainty [5] [6]
DC Current	±100 µA		7	9.8	10	20	21
	±1 mA		7	9.8	10	11	13
	±10 mA		7	9.8	10	11	13
	±100 mA		7	9.8	10	14	16
	± 1 A		15	21	10	24	28
	±10 A [2]		20	28	10[2]	54	57
AC Current	100 µA	10Hz	50	70	20	122	132
		20Hz	50	70	20	122	132
		30Hz	50	70	20	107	118
		40Hz	50	70	20	85	99
		55Hz	50	70	20	85	99
		300Hz	50	70	20	85	99
		1kHz	50	70	20	85	99
		5kHz	100	140	20	129	163
		10kHz	300	420	30	459	548
	1 mA, 10 mA, 100 mA and 1 A [7]	10Hz	40	56	20	113	120
		20Hz	40	56	20	113	120
		30Hz	40	56	20	96	104
		40Hz	40	56	20	75	85
		55Hz	40	56	20	75	85
		300Hz	40	56	20	75	85
		1kHz	40	56	20	75	85
		5kHz	70	98	20	115	134
		10kHz	200	280	30	410	456
	10 A [8]	10Hz	200	280	40	234	308
		20Hz	200	280	40	234	310
		30Hz	200	280	40	234	310
		40Hz	200	280	40	212	292
		55Hz	200	280	40	200	280
		300Hz	200	280	40	200	280
		1kHz	200	280	40	200	280
		5kHz	300	420	50	300	395
		10kHz	600	840	80	337	688
		20kHz	1000	1400	120	1234	1590
Resistance	1 Ω		20	28	1.2	7	9
	2 Ω		15	21	1.2	7	9
	10 Ω		5	7	1.2	7	9
	19 Ω		5	7	1	7	9
	30 Ω		3	4.2	1	6	7
	100 Ω		3	4.2	1	6	6.5
	190 Ω		3	4.2	1	6	7
	300 Ω		3	4.2	1	3	5
	1 kΩ		3	4.2	1	3	4.5
	1.9 kΩ		3	4.2	1	3	5
	3 kΩ		3	4 2	1	3	5
	10 kΩ		3	4.2	1	3	4.5
	19 kΩ		3	4.2	1	3	5
	30 kΩ		5	7	1	6	8
	100 kΩ		5	7	1	6	7.5
	190 kΩ		5	7	1	6	8
	300 kΩ		8	11.2	1.5	11	14
	1 MΩ		8	11.2	1.5	11	13.5
	1.9 MΩ		8	11.2	1.5	11	14
	3 MΩ		12	16.8	2	21	24
	10 MΩ		12	16.8	2	21	23.5
	19 MΩ		12	16.8	2	21	24
	30 MΩ		180	252	20	82	198
	100 MΩ		180	252	20	82	198

[5] Combined uncertainties to 95% minimum confidence level for calibrator calibration assuming Model 4950 successful loop closure within 30 days.
[6] Assumes a successful 4950 transportation loop closure within the Model 4950's 30 day transfer specification.
[7] Uncertainties quoted are for the 100mV and 10mA ranges. Other uncertainties are available on request.
[8] Only when used in conjunction with the Model 4953.