Digital Multimeters
VOAC7523/7522/7520/7521A

Specifications

* Accuracy X% of reading ± Y digits indicated by X+Y
The measuring accuracy indicated below can be obtained for a year following the calibration of the instrument.

1. Typical Sample Rate and Resolution

Sample Rate	Resolution	Reading Rate	Hum Rejection
SLOW	5.5-digit	approx. 4 times/sec	Yes
MID	5.5-digit	approx. 20 times/sec	Yes
FAST	4.5-digit	approx. 100 times/sec	N/A

2. DC Volt (DCV) 50mV range is for the VOAC7523/7522 only.

Range	Resolution		Input Resistance	Accuracy*	
	5.5-digit	4.5-digit		SLOW/MID	FAST
50mV	0.1μV	1μV	100MΩ or more	0.025+10	0.025+15
500mV	1μV	10μV	1000MΩ or more	0.012+5	0.012+10
5V	10μV	100μV		0.012+2	0.012+7
50V	100μV	1mV	approx. 10MΩ	0.016+5	0.016+10
500V	1mV	10mV		0.016+2	0.016+7
1000V	10mV	100mV			

The accuracy in the 50mV and 500mV ranges is specified after zero compensation through the REL operation.
Sample rate in the 50mV range
SLOW/MID: Approx. 0.5 times/sec, FAST: Approx. 50 times/sec
Max. input voltage: 50mV to 5V range ± 800V (continuous)
50V to 1000V range ± 1100V (continuous)

Resolution and noise rejection

Resolution	Sample Rate	NMRR	CMRR
5.5-digit	SLOW	55dB or more	120dB or more
5.5-digit	MID	55dB or more	120dB or more
4.5-digit	FAST	0dB	55dB or more

3. CH-B DC Volt (DCV) VOAC7523/7520 only

Range	Resolution	Input Resistance	Accuracy*	
	4.5-digit		SLOW/MID	FAST

5V	100μV	CH-B:H to CH-B:L 10MΩ ± 3%		0.025+30
50V	1mV	CH-B:H to CH-A:L 5MΩ ± 3%	0.025+2	0.025+8
300V	10mV	CH-B:L to CH-A:L 5MΩ ± 3%		0.025+5

Max. input voltage: ± 300V between CH-A L and CH-B ± 300V

Resolution and noise rejection

Resolution	Sample Rate	NMRR	CMRR	Isolation between CH-A and CH-B
4.5-digit	SLOW/MID	55dB or more	120dB or more	56dB or more
4.5-digit	FAST	0dB	55dB or more	

4. AC Volt (ACV, DC+ACV) detection of True RMS Up to 100kHz for VOAC7520/7521A

Range	Resolution	Measurement Range		Input Resistance
	5.5-digit	SLOW	MID/FAST	
500mV	1μV			less than approx. 1MΩ // 100pF
5V	10μV	15Hz to 300kHz	200Hz to 300kHz	
50V	100μV			
500V	1mV	45Hz to 100kHz	200Hz to 100kHz	
750V	10mV	45Hz to 20kHz	200Hz to 20kHz	

Accuracy: SLOW Sample (Sine wave)

Frequency	Accuracy*
15Hz to 45Hz	0.5+150
45Hz to 100Hz	0.25+150
100Hz to 30kHz	0.2+150
30kHz to 100kHz	0.5+300
100kHz to 300kHz	2.5+1000

Coefficient to input other than sine wave

Crest Factor	Frequency		
	1 to 1.5	1.5 to 2	2 to 3
15Hz to 30kHz	0.05%	0.15%	0.30%
30kHz to 300kHz	0.20%	-	-

Resnponse time

Sample Rate	Resolution	Reading Rate	Response Time
SLOW	5.5-digit	4 times/sec	less than 3 sec
MID/FAST	5.5-digit	20 times/sec	less than 2 sec

Max. input voltage: 780Vrms, ± 1100V DC (continuous)
In the case of DC+ACV, 500 (less than 45Hz) or 300 (45Hz or higher) must be added to the value of Accuracy digit.
Sample rate of FAST becomes the same values as MID (approx. 20 times/sec).

5. DC Current (DCA)

Range	Resolution		Accuracy*		Input Resistance
	5.5-digit	4.5-digit	SLOW/MID	FAST	
5mA	10nA	100nA	0.05+7	0.05+17	less than 150Ω
50mA	100nA	1μA			less than 15Ω
500mA	1μA	10μA			less than 2Ω
10A	100μA	1mA	0.2+7	0.2+17	less than 0.1Ω

Auto range is not available at 5mA to 500mA range and 10A range because of using different input terminals.
Max. input current: 5mA to 500mA range 500mA (FUSE 0.5A/250V)
10A range 10A (FUSE 15A/250V)

6. AC Current (ACA, DC+ACA)

Range	Resolution	Measurement Range		Input Resistance
	5.5-digit	SLOW/MID	FAST	
5mA	10nA	15Hz to 5kHz	200Hz to 5kHz	less than 150Ω
50mA	100nA			less than 15Ω
500mA	1μA	45Hz to 5kHz		less than 2Ω
10A	100μA			less than 0.1Ω

Accuracy: SLOW Sample (Sine wave) 5% or more against the range

Frequency	Accuracy*	Crest Factor		
		1 to 1.5	1.5 to 2	2 to 3
15Hz to 45Hz	1+200	0.05%	0.15%	0.30%

45Hz to 1kHz	0.4+200
1kHz to 5kHz	5.0+200

Response time

Sample Rate	Resolution	Reading Range	Response time
SLOW	5.5-digit	4 times/sec	less than 3 sec
MID/FAST	5.5-digit	20 times/sec	less than 2 sec

Max. input current: 5mA to 500mA range 500mA (FUSE 0.5A)
10A range 10A (FUSE 15A)

DC Component on input current must be included in the Max. input current.
In the case of 10A range at 45Hz to 1kHz, 0.3 must be added to %.
In the case of DC+ACA, 500 (less than 45Hz) or 300 (45Hz or higher) must be added to the value of Accuracy digit.
Sample rate of FAST becomes the same value as MID (approx. 20 times/sec).

7. Resistance (2 WireΩ/4 WireΩ) 4 WireΩ: VOAC7522/7521A only

Range	Resolution		Accuracy*		Test Current
	SLOW/MID	FAST	SLOW/MID	FAST	
50Ω	0.1mΩ	1mΩ	0.025+10	0.025+15	approx. 10mA
500Ω	1mΩ	10mΩ			approx. 10mA
5kΩ	10mΩ	0.1Ω	0.014+3	0.014+8	approx. 1mA
50kΩ	0.1Ω	1Ω			approx. 100μA
500kΩ	1Ω	10Ω	0.015+3	0.015+33	approx. 10μA
5MΩ	10Ω	10Ω	0.033+30	0.033+30	approx. 1μA
50MΩ	100Ω	100Ω	0.25+30	0.25+30	approx. 100nA
500MΩ	1kΩ	1kΩ	1.5+50	1.5+50	approx. 10nA

Max. input voltage: ± 500V peak
Open circuit test voltage: less than 12V

The accuracy at 50Ω to 5kΩ range are specified after zero compensation through the REL operation.
Sample rate of FAST at 5MΩ to 500MΩ range becomes the same value as MID (approx. 20 times/sec).

8. Low-Power Resistance (2 WireΩ)

Range	Resolution	Accuracy*		Test Current
	SLOW/MID/FAST	SLOW/MID	FAST	
500Ω	10mΩ	0.1+5	0.1+15	approx. 1mA
5kΩ	0.1Ω			approx. 100μA
50kΩ	1Ω			approx. 10μA
500kΩ	10Ω	0.2+30	0.2+40	approx. 1μA
5MΩ	100Ω		0.2+30	approx. 100nA
50MΩ	1kΩ	1.5+30	1.5+30	approx. 10nA

Max. input voltage: ± 500V peak

Open circuit test voltage: less than 12V

The accuracy at 500Ω to 5kΩ range are specified after zero compensation through the REL operation.
Sample rate of FAST at 5MΩ to 500MΩ range becomes the same value as MID (approx. 20 times/sec).
Indications are in 4.5 digits for SLOW, MID, and FAST.

9. Diode

Test Current	Measurement Range	Accuracy*	Open Circuit Test Voltave	Max. Input Voltave
approx. 1mA or 10mA	0.1mV to 5.0999V	0.014+13	less than 12V	± 500V peak

10. Temperature

Thermo Couple	Measurement Range	Resolution	Accuracy*	Max. Input Voltave
R	-50 to +1768 °C	0.1°C	0.2+30	± 500V peak
K(CA)	-270 to +1372 °C		0.1+15	
T(CC)	-270 to +400 °C			
J(IC)	-210 to +1200 °C		0.15+15	
E(CRC)	-270 to +1000 °C			

Resolution: 4.5-digits, Sample rate at SLOW/MID/FAST: approx. 2 times/sec

11. Frequency (AC couple, Crest Factor: less than 3)

Sample	Reading Rate	Display Digits and	Accuracy*

Rate	(Gate time)	Measurement Range		
SLOW	approx. 0.5 times/sec (1s)	6-digit	15.0000Hz to 1.00000MHz	
MID	approx. 4 times/sec (100ms)	5-digit	15.000Hz to 1.0000MHz	0.02+2
FAST	approx. 10 times/sec (10ms)	4-digit	150.00Hz to 1.000MHz	

AUTO range of ACV must be used with input attenuator.
Max. input voltage: 780 Vrms, ± 1100V peak

12. Chart for combination of Dual Function

	DCV	CH-B DCV (*)	ACV	DC+ ACV	DCA	ACA	DC+ ACA	2 WireΩ	4 WireΩ(**)	Hz	°C
DCV	×	○	△	△	△	△	△	×	×	△	△
CH-B DCV (*)	○	×	○	○	○	○	○	○	-	○	○
ACV	△	○	×	○	○	△	△	×	×	○	×
DC+ACV	△	○	○	×	○	△	△	×	×	○	×
DCA	△	○	○	○	×	△	△	△	△	○	×
ACA	△	○	△	△	△	×	○	△	△	△	×
DC+ACA	△	○	△	△	△	○	×	△	△	△	×
2 WireΩ	×	○	×	×	△	△	△	×	△	×	×
4 WireΩ(**)	×	-	×	×	△	△	△	△	×	×	×
Hz	△	○	○	○	○	△	△	×	×	×	×
°C	△	○	×	×	×	×	×	×	×	×	×

○: Available △: have a limitation ×: N/A - : not provided

(*) CH-B DCV: VOAC7523/7520 only

(**) 4 WireΩ: VOAC7522/7521A only