



Agilent 33502A 2-channel 50 Vpp Isolated Amplifier

Data Sheet



- Full-power BW 100kHz @ 50Vpp
- Small-signal BW > 300kHz
- Slew Rate 20V/μs min.
- THD+N < 0.01% @ 10kHz, 40Vpp.
- Output drive 200mA max.
- Isolation Floats ±42Vpk to earth

The Agilent 33502A is a dual-channel, high voltage output amplifier. It has an isolated analog front end with up to 50 Vpp (± 25 V) output voltage range. It is also a very low-distortion amplifier with < 0.01% @ 10 kHz and 40 Vpp. The 33502A is designed to work as a companion for function generators to offer low-distortion, higher voltage outputs.

The 33502A has a fully isolated front end, which offers superior 5X voltage amplification to other amplifiers. You can independently configure input coupling (AC | DC) and input impedance (50Ω | 1MΩ) to match your circuit. The input path can also be switched from amplified to direct (unamplified) without removing or connecting cables.

The 33502A, in a 2 unit, half-rack mechanical form factor, fits well on both your bench and in your test system. It also is configured with LAN (LXI Class-C compliant) and USB interfaces to meet your computer IO needs.

The 33502A provides both a programmable interface and a softkey-driven front panel for flexibility in configuring.

The 33502A is compatible with existing Agilent function/arbitrary waveform generators including the 33120A, 33210A, 33220A, and 33250A. It can also be used to amplify signals from non-Agilent function and arbitrary waveform generators.



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Table 1.

Feature	Characteristic
General	
Number of channels	2
Channel to channel ground connection	Not connected in BYPASS ON. Connected with both channels OFF or in Gain of 5x
Floating Voltage	± 42 Vpk to earth
Input Configuration & Specification	
Input Coupling	
AC Coupling	Programmable
DC Coupling	Default, Programmable
Input Impedance	
1M Ω	Default, Programmable
50 Ω	Programmable
Input Voltage Range	
Maximum Voltage Range	± 5 Vpk for gain of 5x, ± 30 Vpk for bypass
Damage Level	± 10 Vpk for 50 Ω input ± 35 Vpk for 1 M Ω input
Input Path	Programmable gain of 5x, bypass (1x), or off state
Input Gain 5X	5X, Fixed, Non-Inverting
Gain Accuracy ²	$\pm 0.1\%$ @ 1KHz
Flatness DC coupling ¹	0.1% : dc - 10KHz 1% : dc - 40KHz 5% : dc - 100KHz
Flatness AC coupling ¹	0.1% : 30Hz - 10KHz 1% : 10Hz - 40KHz 5% : 3Hz - 100KHz
Small Signal Bandwidth ¹	> 300 KHz (-3db)
Full Power Bandwidth ¹	100KHz @ 50Vpp output
Input Bypass	
Bandwidth for 50 Ω system Maximum Current	> 300 MHz (-3db) 0.2 Apk
Noise	
Input referred noise	< 40nV/ rt-Hz @ 1kHz
Output Configuration & Specification	
Output Current	200mA. (150mA for continuous output from -8V to +8V)
DC Output Resistance	< 2 Ω
Max Output Level ¹	± 25 Vpk
Output DC Offset	< 10mV
Output Slew Rate ¹	> 20V/ μ s
THD + N ¹	< 0.01% @ 10kHz, 40 Vpp
Aberrations ¹	< 5% for waveforms with < 3V input step or non slewing output

¹For all loads >250 ohms and <400 pF of capacitance²Measured with ≥ 1 Mohm load and 1 Mohm input selection.

Table 1 (cont'd).

Feature	Characteristic
Transition time ¹ (Final value $\pm 1\%$ of step size)	2.5uSec+ 50nSec/volt of output step
Channel to channel isolation for gains of 5x	> 75dB
Capacitive Load for no oscillation	< 1 nF
Output Protection	Continuous short circuit protection
	Thermal overload shutdown.
	Over temperature status flag.

¹For all loads >250 ohms and <400 pF of capacitance.

Table 2

General Characteristics	
Power Supply	100V/120V/ 220V / 240V $\pm 10\%$
Power Line Frequency	50–60 Hz $\pm 10\%$, 400 Hz $\pm 10\%$.
Power Consumption	100 VA peak (typical value depends on configuration and load)
Operating Environment	Full accuracy for 0 °C to 55 °C Full accuracy to 80% R.H. at 40°C Non–condensing
Storage Temperature	–40 °C to 70 °C
Operating Altitude	Up to 3000m
Bench Dimensions (WxHxD)	261.2mm x 103.8mm x 303.2mm
Weight	3.1 kg (6.8 lbs)
Safety	Complies with European Low Voltage Directive and carries the CE-marking
	Conforms to UL 61010-1, CSA C22.2 61010-1, and IEC 61010-1:2001
EMC	Complies with European EMC Directive for test and measurement products. - IEC/EN 61326-1 - CISPR Pub 11 Group 1, class A - AS/NZS CISPR 11 - ICES/NMB-001
	Complies with Australian standard and carries C-Tick mark This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme à la norme NMB-001 du Canada
Acoustic Noise	Normal operating mode: SPL 35db(A)
Display	4.3" Color TFT WQVGA (480x272), LED backlight
Remote Interfaces	10/100Mbit LAN USB 2.0 Standard
Language	SCPI – 1994.0, IEEE–488.2
LXI Compliance	LXI Class C, Version 1.0
Number of Channels	2
Channel to channel ground connection	Not connected in BYPASS ON. Connected with both channels OFF or in Gain of 5x
Floating Voltage	± 42 Vpk to earth

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