

PULSE AMPLIFIER

A275

FEATURES

- Power 15 mW
- Slew Rate 100 V/ μ s
- Input Noise 4 nV/ $\sqrt{\text{Hz}}$
- Stable DC Operation
- 200 MHz Gain-Bandwidth Product
- High Reliability Screening
- Radiation Hard to 10^5 rad(Si)
- Unity Gain Stable

APPLICATIONS

- Space Instrumentation
- Portable Instrumentation
- Nuclear Instrumentation
- Precision Active Filter Design
- Pulse Shaping



The A275 is a high performance hybrid differential op-amp developed as a pulse amplifier for spaceborne nuclear instrumentation.

Its low power dissipation (15 mW), high slew rate (100 V/ μ s), and low input noise (4 nV/ $\sqrt{\text{Hz}}$), make it ideal for use in a wide range of op-amp applications. The A275 is packaged in a standard 14-pin hybrid DIP.

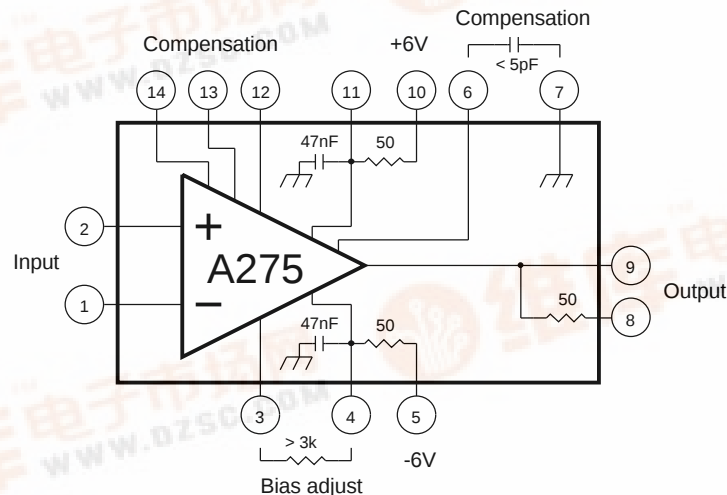


Figure 1. - Connection diagram

Pin	Function
1	Inverting input
2	Non-inverting input
3	Bias adjust to Pin 4, (R > 3 kohm)
4	-Vs direct
5	-Vs through 50 ohms
6	Compensation to Pin 7, (C = 0 to 5 pF)
7	Case and Ground
8	Output through 50 ohms
9	Output direct
10	+Vs through 50 ohms
11	+Vs direct
12 - 14	Compensation (leave open for gain < 10, short for gain > 10)



Absolute Maximum Ratings

Supply Voltage	$\pm 8\text{ V}$
Input Voltage	$\pm V_S$
Operating Temperature	$-55\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$
Storage Temperature	$-65\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$
Lead Temperature Range (Soldering, 10 sec.)	$+300\text{ }^{\circ}\text{C}$

Electrical Characteristics		$V_S = \pm 6\text{ V}, T_A = +25\text{ }^{\circ}\text{C}$				
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Input Offset Voltage	V_{OS}			2	5	mV
Input Offset Current	I_{OS}			0.1	0.6	μA
Input Bias Current	I_B			1.5	4	μA
Input Capacitance	C_{IN}			4		pF
Differential Input Resistance	R_{IN}			44		kohm
Common-Mode Input Resistance	R_{IN}		5	8		Mohm
Common-Mode Rejection Ratio	CMRR		90	95		dB
Common-Mode Input Range	IVR			± 4.5		V
Power Supply Rejection Ratio	PSRR			60		dB
Large-Signal Voltage Gain @5kHz	A_{LFC}	compensated	64	66		dB
@5kHz	A_{LF}	uncompensated	72	74		
@10MHz	A_{HFC}	compensated	16	20		
@10MHz	A_{HF}	uncompensated	24	28		
Pulse Risetime ($A_V = 10$)	trc	compensated		15	22	ns
	tr	uncompensated		9	15	
Output Voltage Swing	V_{OP}	positive	+4.5	+4.7		V
	V_{ON}	negative		-4.5	-4.5	
Open Loop Output Resistance	R_O			750		ohm
Output Short-Circuit Current	I_{OSC}	source		11		mA
		sink		-4		
Slew Rate	S_{RP}	positive	65	100		V/ μs
	S_{RN}	negative	35	57		
Input Noise Voltage Density	e_N			4		nV/ $\sqrt{\text{Hz}}$
Supply Current	I_S		± 1.1	± 1.25	± 1.4	mA
Power Consumption	P_D			15		mW

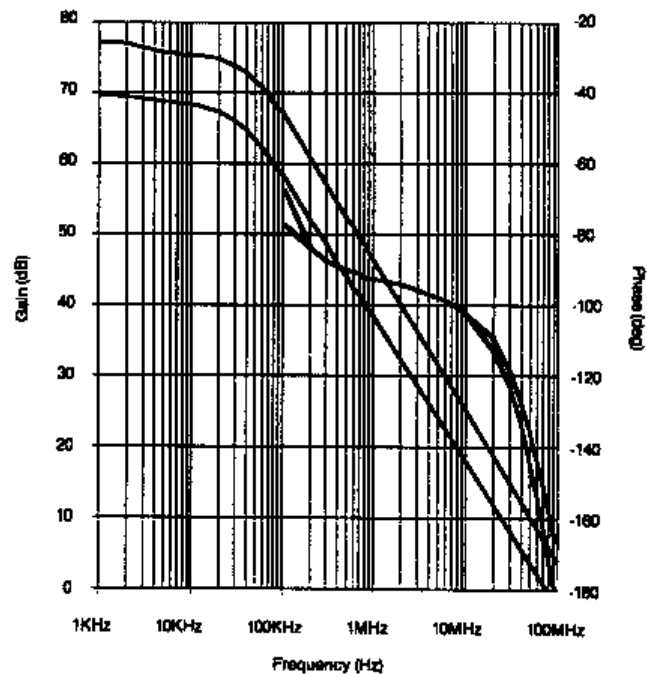


Figure 2. - A275 gain & phase

The A275 can be tested as a shaping amplifier by using the circuit shown in Figure 3. The PC-275 TEST BOARD will accommodate three (3) A275s and will produce a 5-pole pulse with 1 μ s risetime (2.3 μ s peaking time).

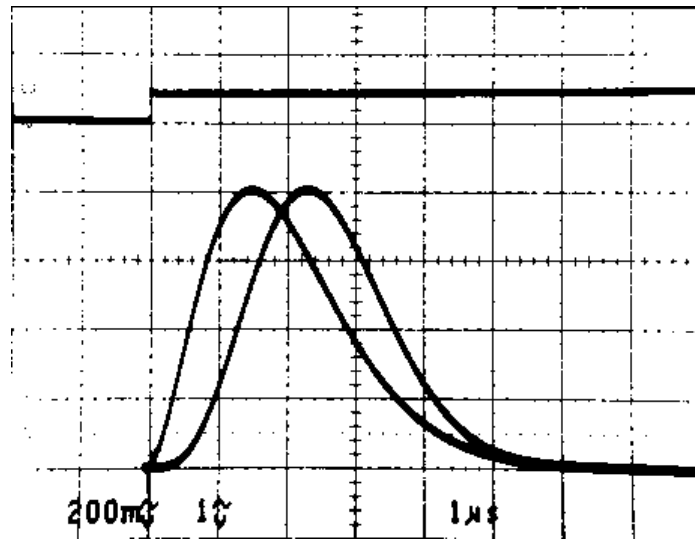


Figure 3. - A275 pulse characteristics

