PULSE AMPLIFIER

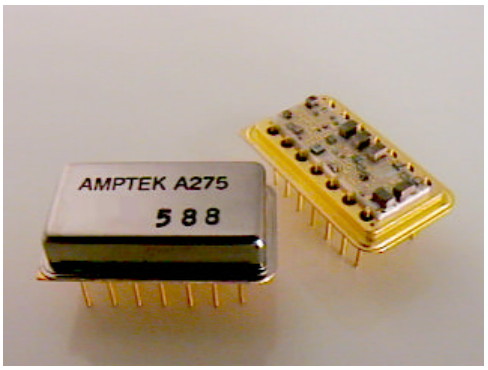
A275

FEATURES

- Power 15 mW
- Slew Rate 100 V/µs
- Input Noise 4 nV/√Hz
- Stable DC Operation
- 200 MHz Gain-Bandwidth Product
- High Reliability Screening
- Radiation Hard to10^5 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/µs), and low input noise (4 nV/√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.

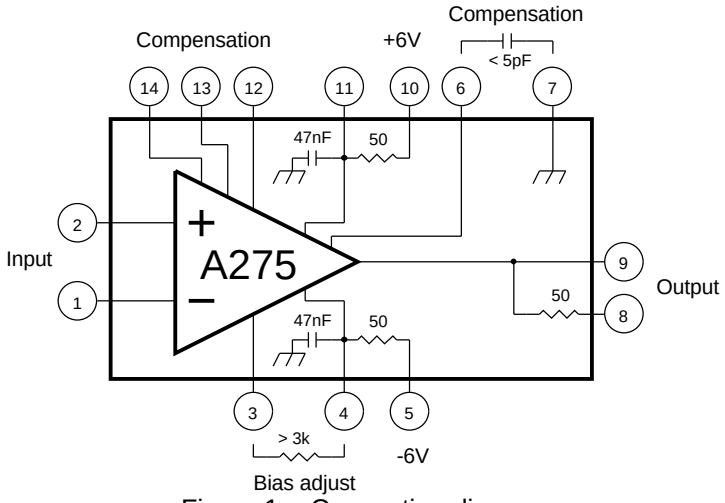


Figure 1. - Connection diagram

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)

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Absolute Maximum Ratings	
Supply Voltage	±8 V
Input Voltage	$\pm V_S$
Operating Temperature	-55 °C to +125 °C
Storage Temperature	-65 °C to +150 °C
Lead Temperature Range (Soldering, 10 sec.)	+300 °C

Electrical Characteristics V_S = ±6 V, T_A = +25 °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 @5kHz @10MHz @10MHz	 A_{LFC} A_{LF} A_{HFC} A_{HF}	 compensated uncompensated compensated uncompensated	 64 72 16 24	 66 74 20 28		dB
Pulse Risetime (A_V = 10)	trc tr	compensated uncompensated		15 9	22 15	ns
Output Voltage Swing	V_{OP} V_{ON}	positive negative	+4.5	+4.7 -4.5	 -4.5	V
Open Loop Output Resistance	R_O			750		ohm
Output Short-Circuit Current	I_{OSC}	source sink		11 -4		mA
Slew Rate	S_{RP} S_{RN}	positive negative	65 35	100 57		V/µs
Input Noise Voltage Density	e_N			4		nV/√Hz
Supply Current	I_S		±1.1	±1.25	±1.4	mA
Power Consumption	P_D			15		mW

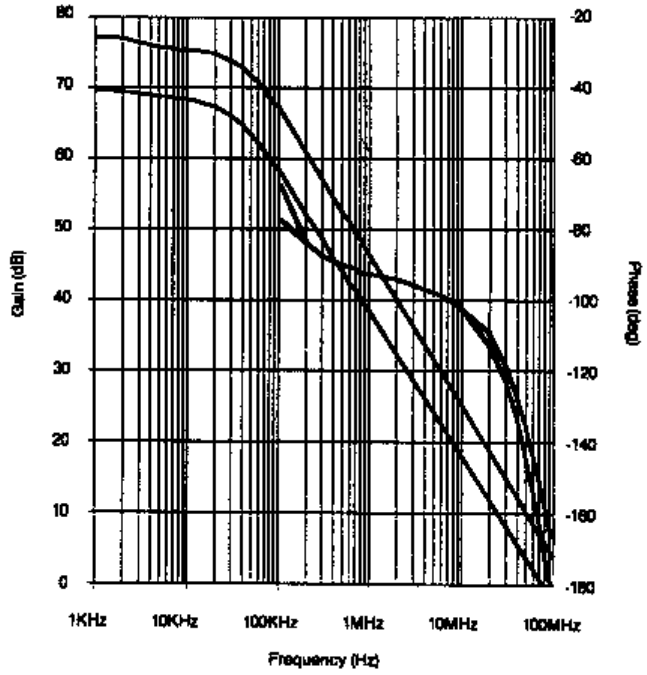

Figure 2. - A275 gain & phase

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 µs risetime (2.3 µs peaking time).

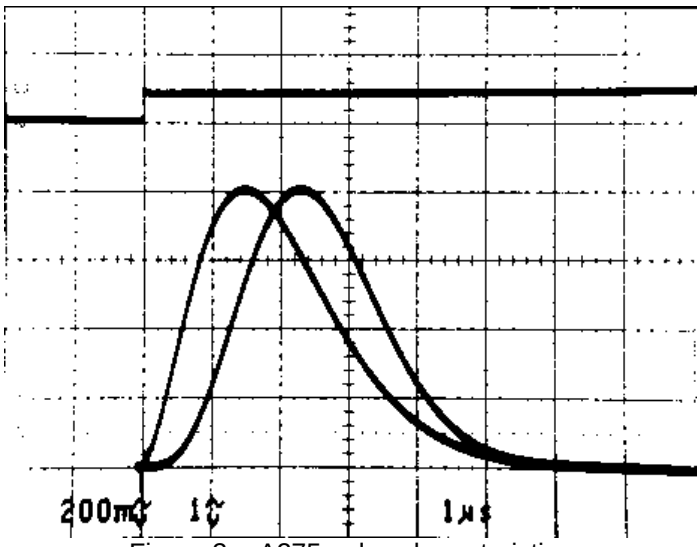

Figure 3. - A275 pulse characteristics

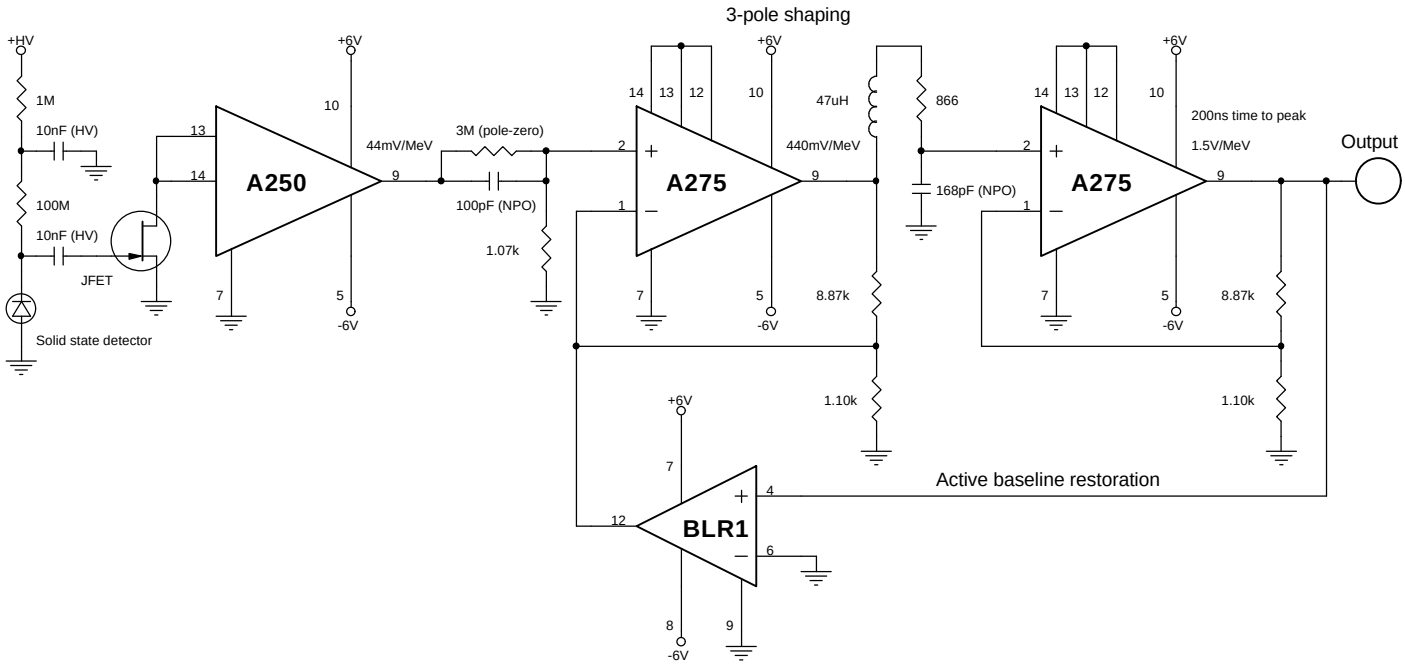

Figure 4. - The A250 connected to a solid state detector with 3-pole shaping and active baseline restoration.

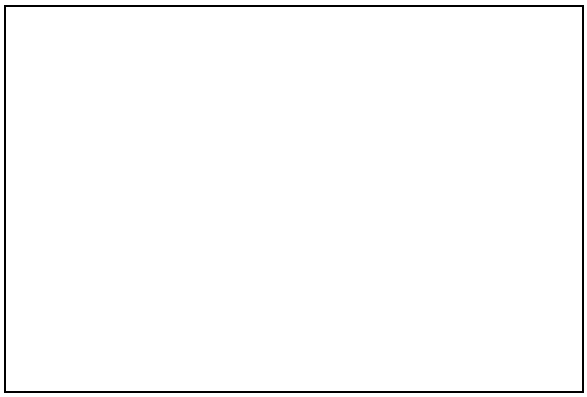

Figure 5. - General case for 3 and 5-pole response for different peaking times (T_P)