

1. DESCRIPTION

The XD4136 monolithic quad operational amplifier consists of four independent high gain, internally frequency compensated operational amplifiers. The specifically designed low noise input transistors allow the XD4136 to be used in low noise signal processing applications such as a audio preamplifiers and signal conditioners. The simplified output stage completely eliminates crossover distortion under any load conditions, has large source and sink capacity, and is short-circuit protected. A novel current source stabilizes output parameters over a wide power supply voltage range.

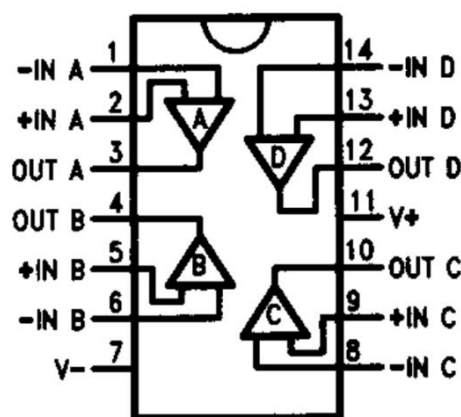
2. FEATURES

- Unity gain band width-3.0 MHz
- Continuous short circuit protection
- No frequency compensation required
- No latch up
- Large common mode and differential voltage range
- Parameter tracking over temperature range
- Gain and phase match between amplifiers

3. APPLICATIONS

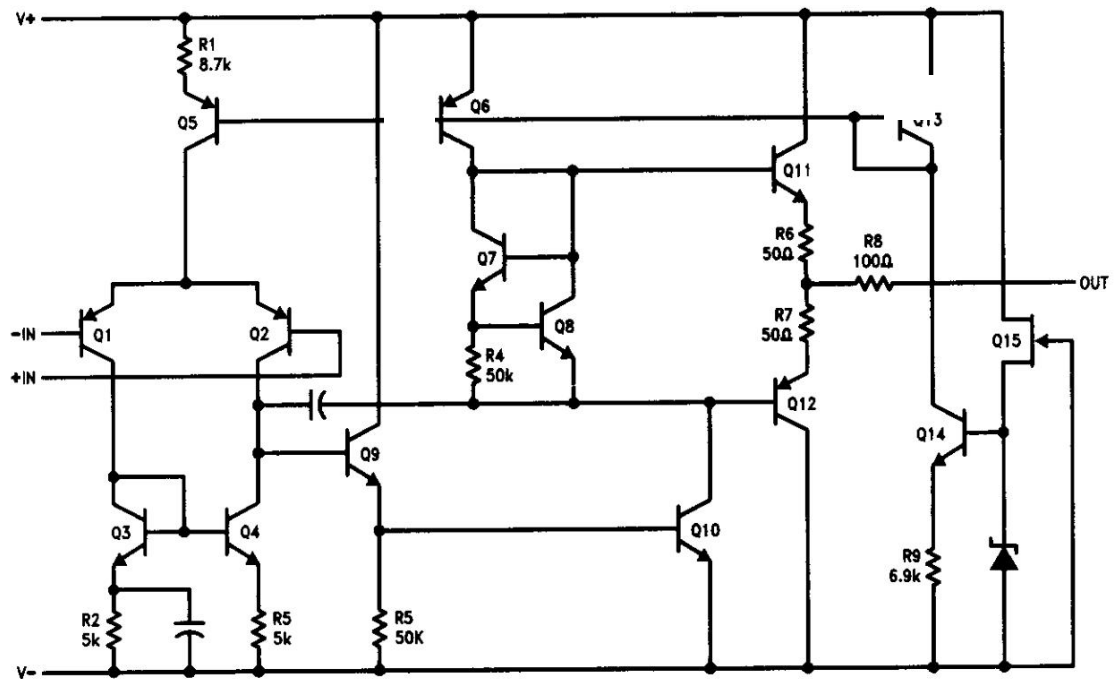
- Audio preamplifiers
- Signal conditioning

4. CONNECTION DIAGRAMS



Top View

5. EQUIVALENT CIRCUIT



6. ABSOLUTE MAXIMUM RATINGS

Storage temperature range

Molded DIP.....-65°C to 150°C

Operating Temperature Range.....0°C to +70°C

Lead Temperature

Ceramic DIP(Soldering =,60 sec.)..... 300°C

Molded DIP

(Soldering,10sec.)..... 265°C

Internal Power Dissipation

14L-Ceramic DIP..... 1.36W

14L-Molded DIP.....1.04W

Supply Voltage..... $\pm 18V$

Differential Input Voltage..... $\pm 30V$

Input Voltage..... $\pm 15V$

Output Short Circuit Duration..... Indefinite

ESD Tolerance..... 1000V

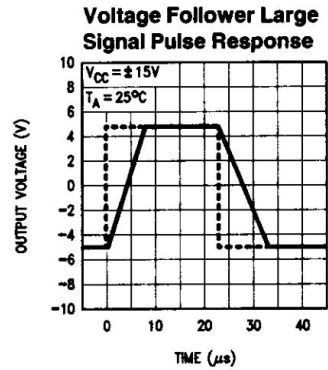
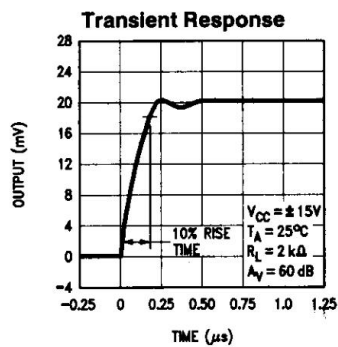
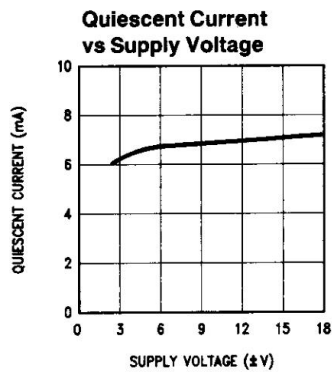
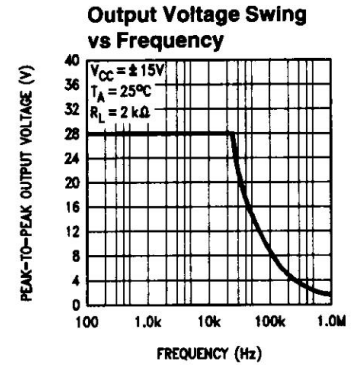
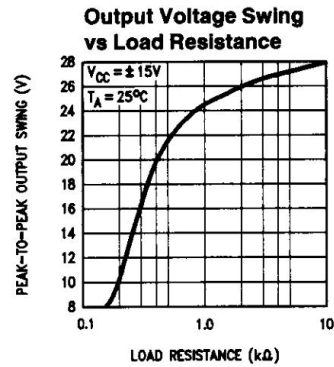
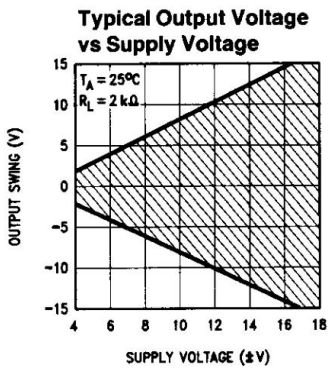
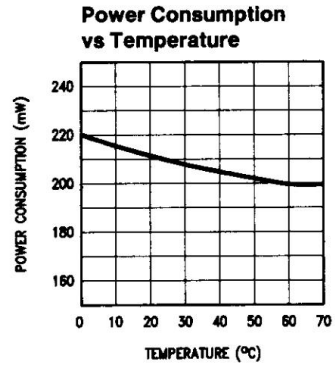
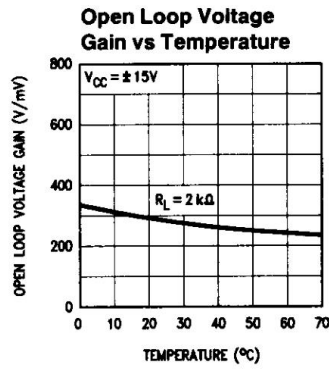
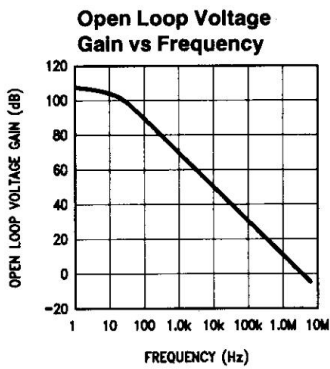
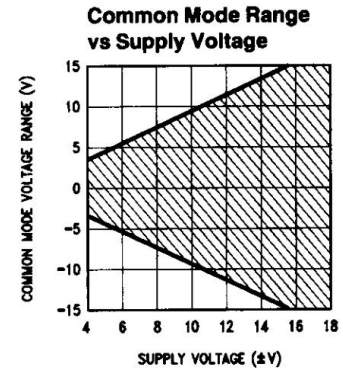
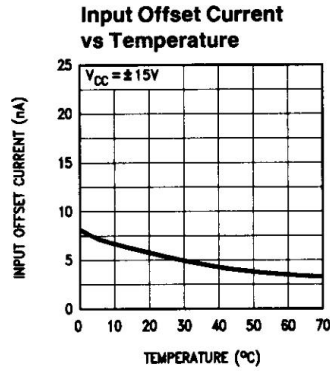
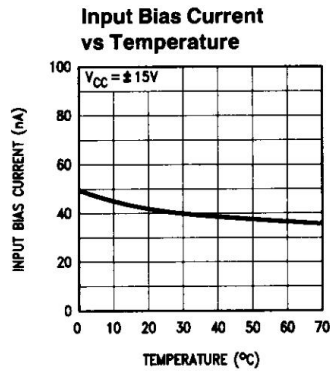
7. ELECTRICAL CHARACTERISTICS

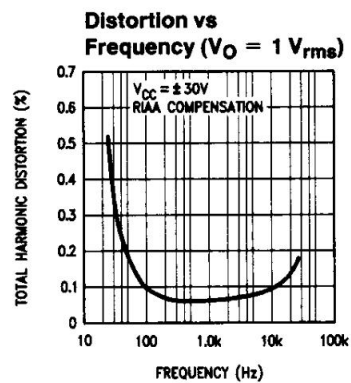
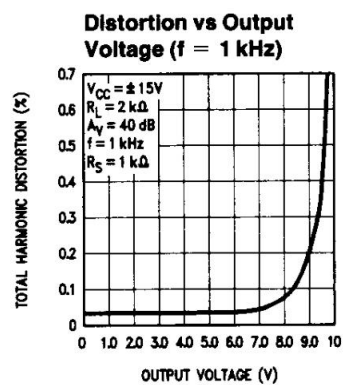
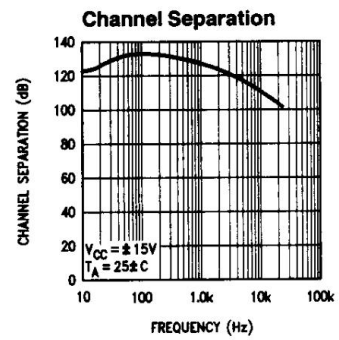
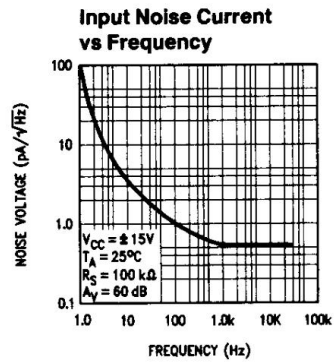
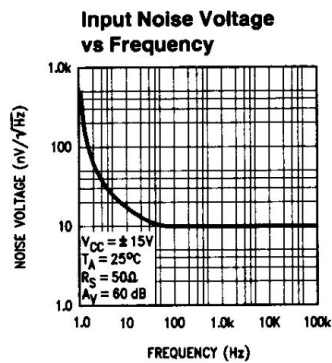
Symbol	Parameter		Conditions	Min	Typ	Max	Units
V_{IO}	Input Offset Voltage		$R_S \leq 10k\Omega$		0.5	6.0	mV
I_{IO}	Input Offset Current				5.0	200	nA
I_{IB}	Input Bias Current				40	500	nA
Z_i	Input Impedance			0.3	5.0		M Ω
P_C	Power Consumption				210	340	mW
CMR	Common Mode Rejection		$R_S \leq 10k\Omega$	70	90		dB
V_{IR}	Input Voltage Range			± 12	± 14		V
PSRR	Power Supply Rejection Ratio		$R_S \leq 10k\Omega$		30	150	$\mu V/mV$
A_{VS}	Large Signal Rejection Gain		$R_S \geq 2.0k\Omega, V_O = \pm 10V$	20	300		V/mV
V_{OP}	Output Voltage Swing		$R_L = 10k\Omega$	± 12	± 14		V
			$R_L = 2.0k\Omega$	± 10	± 13		
TR	Transient Response	Rise Time	$V_I = 20mV, R_L = 2.0k\Omega$ $C_L = 100pF, A_V = 1.0$		0.13		μs
		Overshoot			5.0		%
BW	Bandwidth				3.0		MHz
SR	Slew Rate				1.0		V/ μs
CS	Channel Separation				105		dB
					105		

The following specifications apply over the range of $0^\circ C \leq T_A \leq +70^\circ C$

V_{IO}	Input Offset Voltage	$R_S \leq 10k\Omega$			7.5	mV
I_{IO}	Input Offset Current				300	nA
I_{IB}	Input Bias Current				800	nA
P_C	Power Consumption	$T_A = T_{A \text{ Max}}$		180	300	mW
		$T_A = T_{A \text{ Min}}$		240	400	
A_{VS}	Large Signal Voltage Gain	$R_L \geq 2.0k\Omega, V_O = \pm 10V$	15			V/mV
V_{OP}	Output Voltage Swing	$R_L = 2.0k\Omega, V_{CC} = \pm 15V$	± 10			V

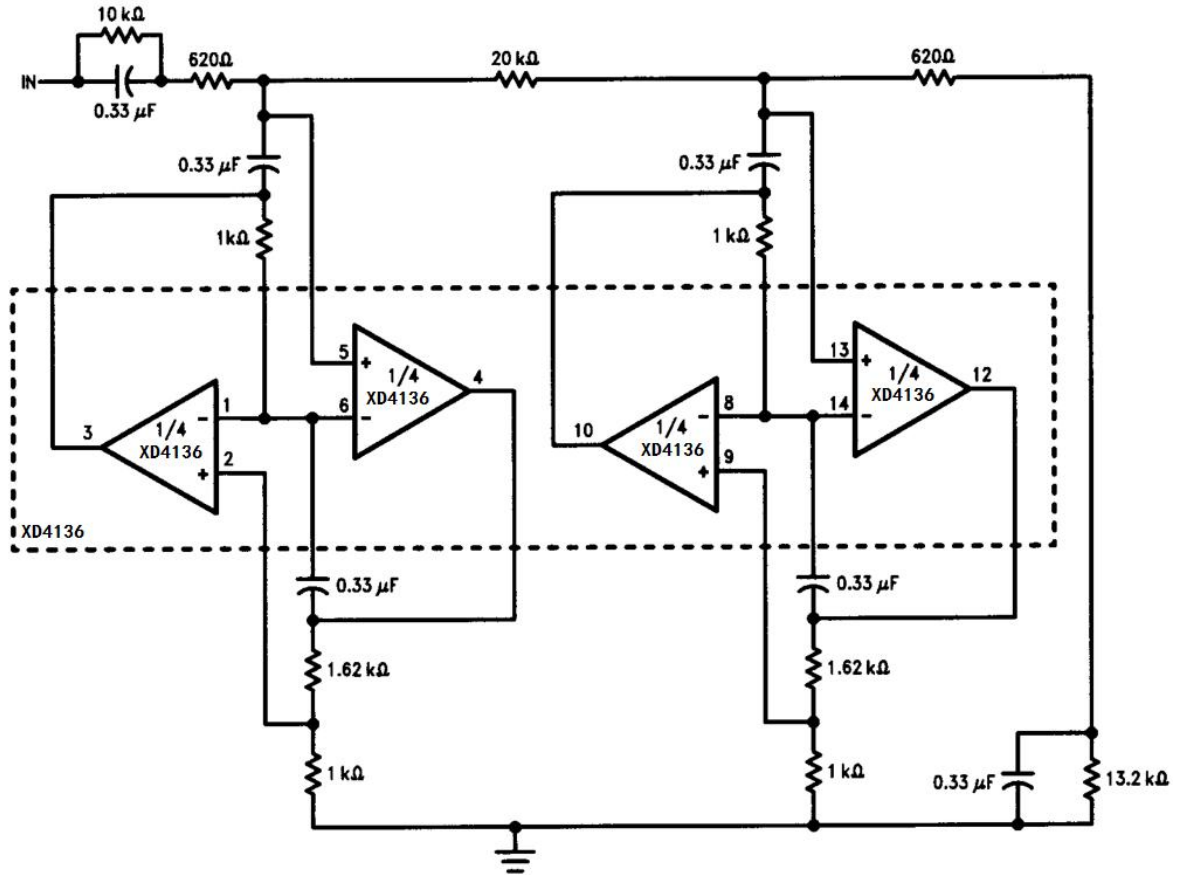
8. TYPICAL PERFORMANCE CHARACTERISTICS



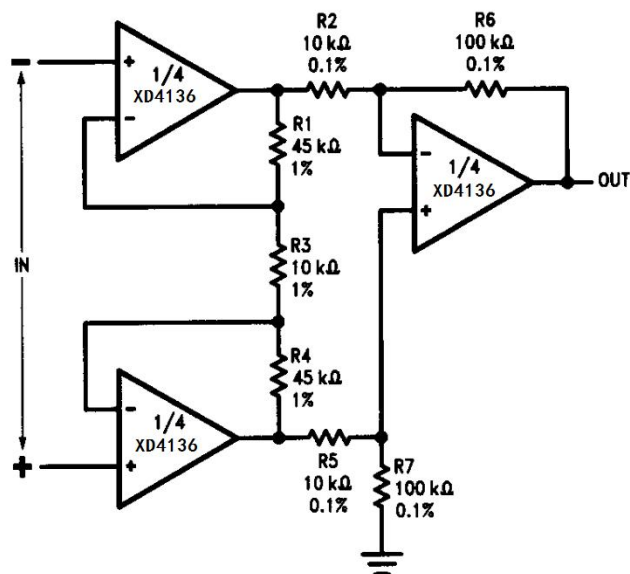


9. TYPICAL APPLICATIONS

400 Hz Lowpass Butterworth Active Filter



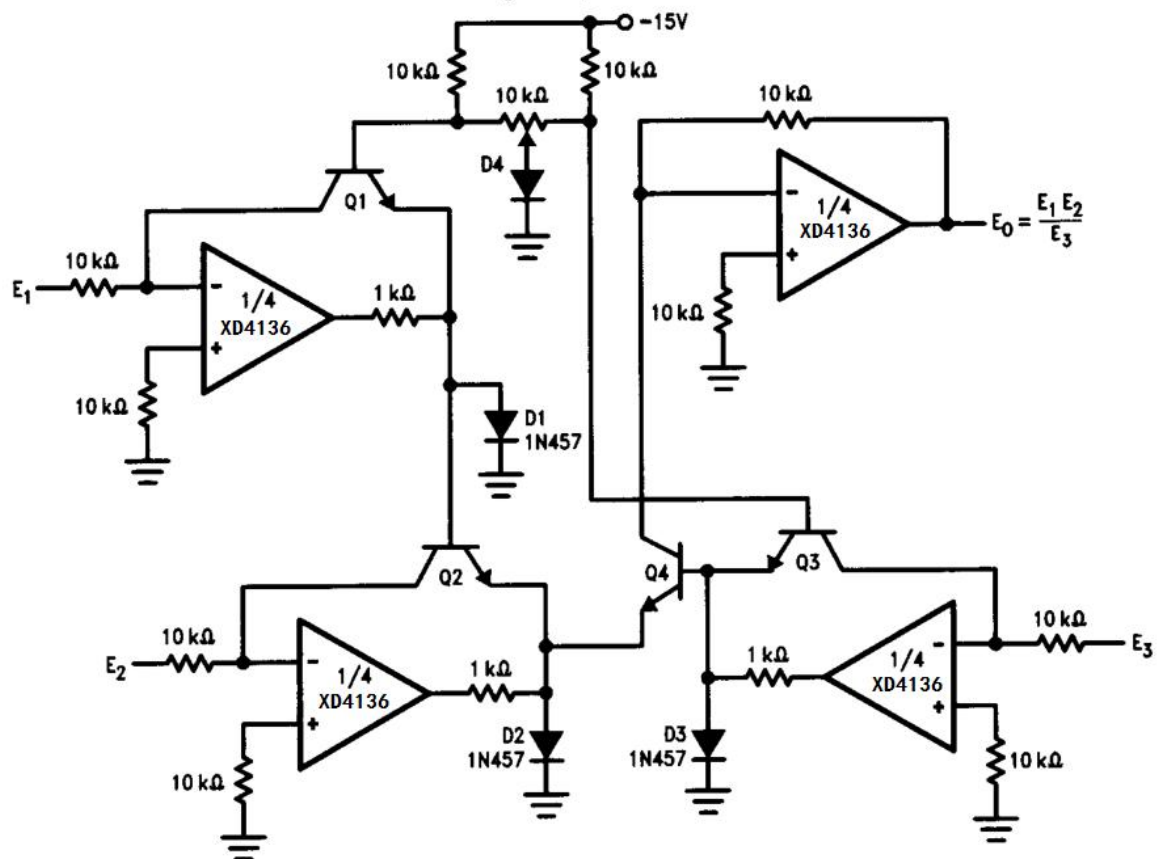
Differential Input Instrumentation Amplifier with High Common Mode Rejection



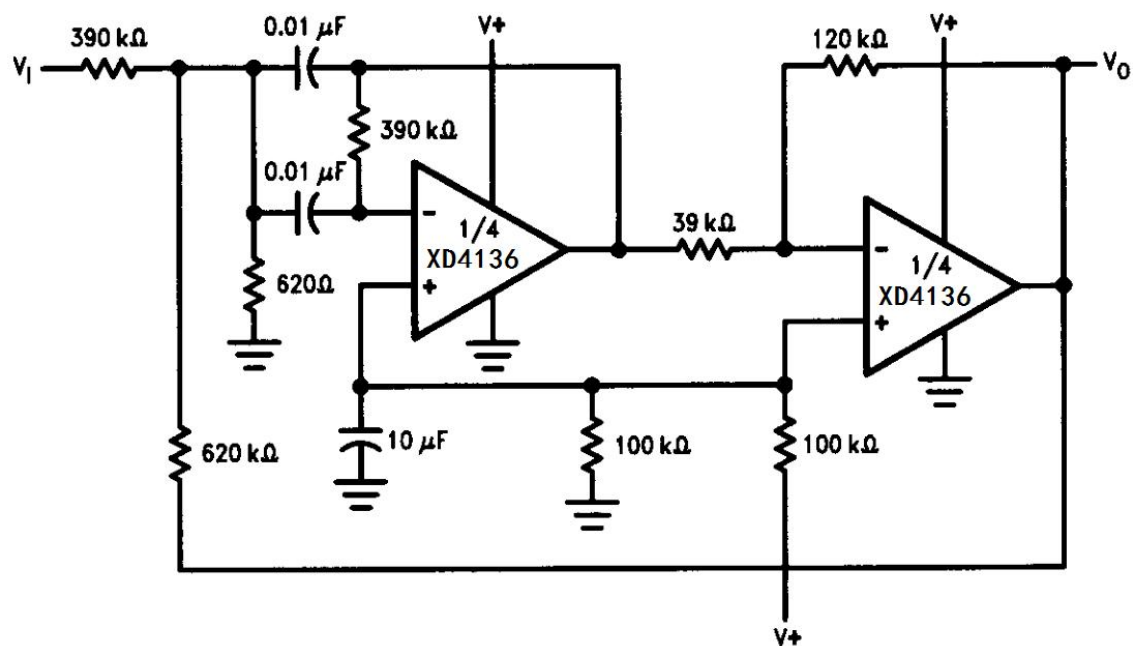
$$A_v = \frac{R_6}{R_2} \left(1 + \frac{2R_1}{R_3} \right)$$

Matching determines CMRR:
 $R_1 = R_4$
 $R_2 = R_5$
 $R_6 = R_7$

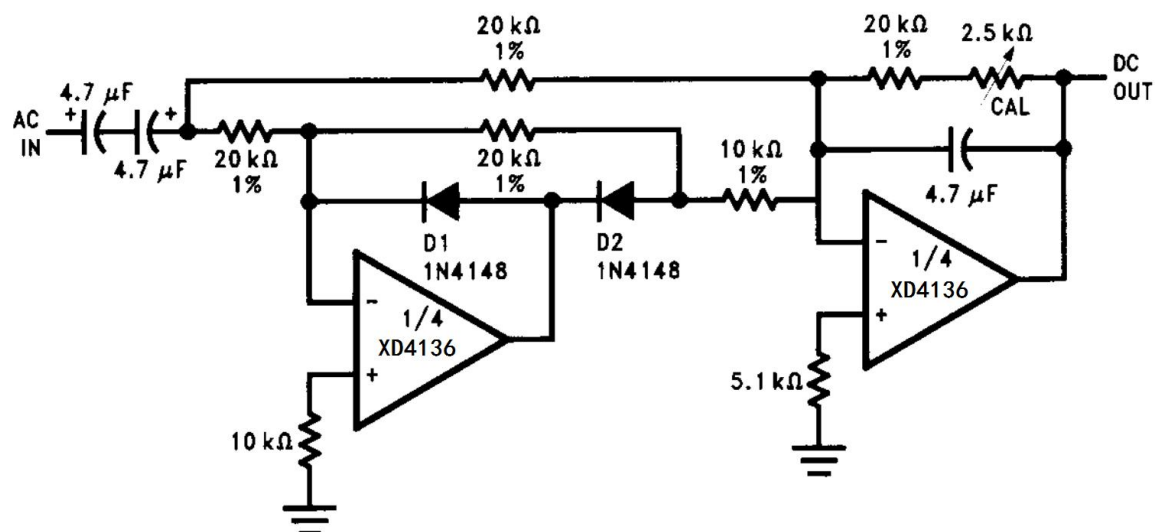
Analog Multiplier/Divider



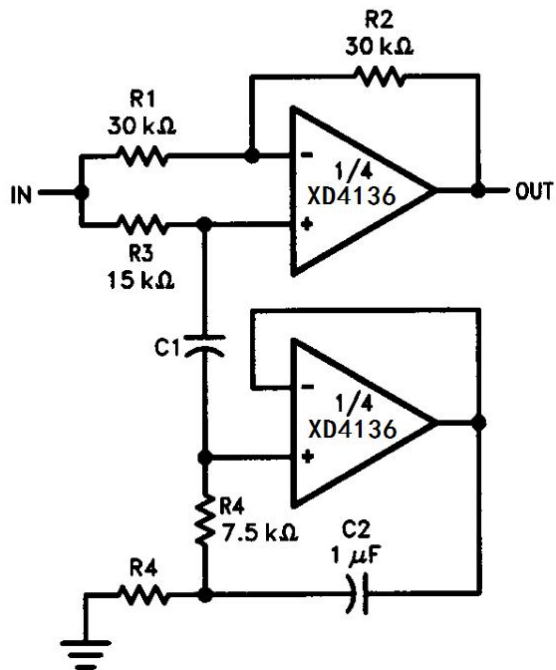
1 kHz Bandpass Active Filter



Full-Wave Rectifier and Averaging Filter



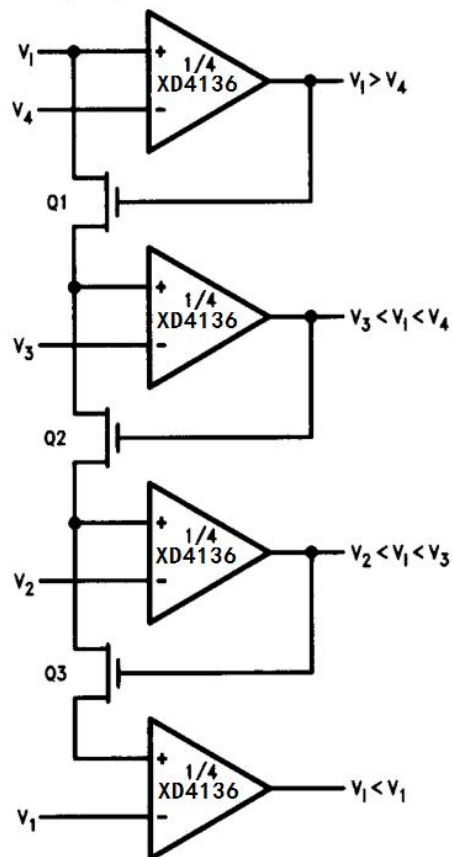
Notch Filter Using the XD4136 as a Gyrator



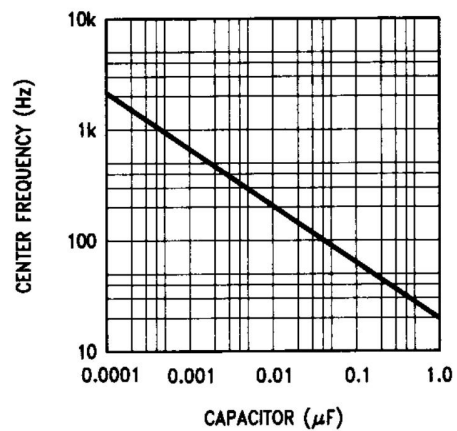
Trim R, Such That

$$\frac{R1}{R2} = \frac{R3}{2 R4}$$

Multiple Aperture Window Discriminator



Notch Frequency vs Capacitor

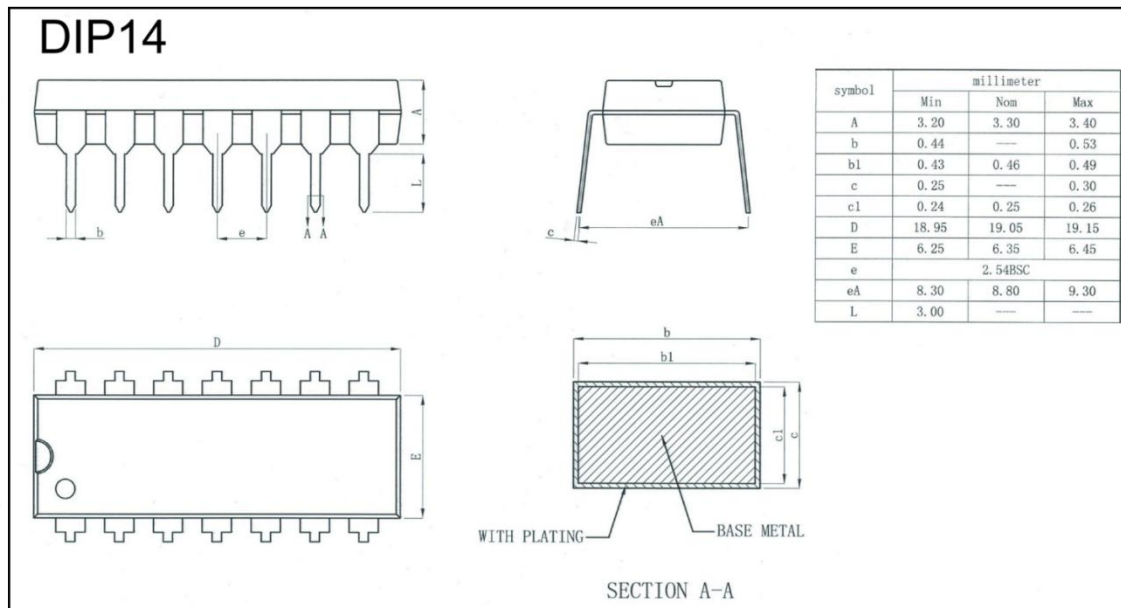


10. ORDERING INFORMATION

Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XD4136	XD4136	DIP14	19.05 * 6.35	-0 to 70	MSL3	Tube 25	1000

11. DIMENSIONAL DRAWINGS



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