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NTE727 **Integrated Circuit** **Four Independent AC Amplifiers**

Description:

The NTE727 is a silicon monolithic integrated circuit in a 16-Lead DIP type package consisting of four independent identical AC amplifiers which can operate from a single-ended power supply.

The amplifiers include internal DC bias and feedback to provide temperature-stabilized operation. They may be used in a wide variety of AC applications in which operational amplifiers have previously been used.

Each high gain amplifier has a high impedance non-inverting input, and a lower impedance inverting input for the application of feedback. Two power-supply terminals and two ground terminals are provided to reduce internal and external coupling between amplifiers.

Features:

- Four AC Amplifiers on a Common Substrate
- Independently Accessible Inputs and Outputs
- Operates from a Single-Ended Supply
- Noise Figure (Each Amp): 2dB Typ @ 1kHz
- High Voltage Gain (Each Amp): 53dB Min
- High Input Resistance (Each Amp): 90k Ω Typ
- Undistorted Output Voltage (Each Amp): 2V_{rms} Min
- Output Impedance (Each Amp): 1k Ω Typ
- Open-Loop Bandwidth (Each Amp): 300kHz Typ

Applications:

- Multi-Channel or Cascade Operation
- Low-Level Preamplifiers
- Equalizers
- Linear Signal Mixers
- Tone Generators
- Multivibrators
- AC Intergrators

Absolute Maximum Ratings: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Power Supply Voltage	+16V
AC Input Voltage	$0.5V_{\text{rms}}$
Power Dissipation ($T_A = +55^\circ\text{C}$), P_D	750mW
Derate Above 55°C	$7.7\text{mW}/^\circ\text{C}$
Operating Temperature Range, T_{opr}	-40° to $+85^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° to $+150^\circ\text{C}$

Electrical Characteristics: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit	
Static ($V_{\text{CC}} = 12\text{V}$)							
Current Drain Per Amplifier Pair	I_{12} or I_{15}		9.5	13.5	17.5	mA	
DC Voltage at Output Terminals	$V_1, V_6,$ V_{11}, V_{16}		6.1	6.9	8.1	V	
DC Voltage at Feedback Terminals	$V_3, V_7,$ V_{10}, V_{14}		1.7	2.0	2.3	V	
DC Voltage at Input Terminals	$V_4, V_8,$ V_9, V_{13}		2.2	2.5	2.8	V	
Dynamic (Characteristics given are for each amplifier with no AC feedback)							
Open-Loop Gain	A_{OL}	$V_{\text{CC}} = 12\text{V}, E_{\text{IN}} = 2\text{mV}, f = 10\text{kHz}$	53	58	–	dB	
Output Voltage Swing	$V_{\text{O(rms)}}$	$V_{\text{CC}} = 12\text{V}, f = 1\text{kHz}, \text{THD} = 5\%$	2.0	2.4	–	V	
Open-Loop –3dB Bandwidth	BW	$V_{\text{CC}} = 12\text{V}, E_{\text{IN}} = 2\text{mV}$	250	300	0	kHz	
Total Harmonic Distortion	THD	$V_{\text{CC}} = 12\text{V}, f = 1\text{kHz}, E_{\text{OUT}} = 2V_{\text{rms}}$	–	0.65	–	%	
Input Resistance	R_{IN}	Open Loop, $f = 1\text{kHz}$, Note 1	–	90	–	$\text{k}\Omega$	
Input Capacitance	C_{IN}	$f = 1\text{MHz}$	–	9	–	pF	
Output Resistance	R_{OUT}	Note 1	–	1	–	$\text{k}\Omega$	
Output Capacitance	C_{OUT}	$f = 1\text{MHz}$	–	18	–	pF	
Feedback Capacitance (Output to Non-Inverting Input)	C_{FB}	$V_{\text{CC}} = 12\text{V}, f = 1\text{MHz}$	–	<0.1	–	pF	
Broad-Band Output Noise Voltage	E_{N}	$V_{\text{CC}} = 12\text{V}, R_{\text{S}} = 10\text{k}\Omega, A = 40\text{dB}$, Equivalent Noise BW = 50kHz	–	0.3	1.0	mV	
Output Noise Voltage “Weighted”	$E_{\text{N(WT)}}$		–	0.5	2.2	mV	
Noise Figure	NF	$R_{\text{S}} = 5\text{k}\Omega$	$f = 10\text{Hz}$	–	10.0	–	dB
			$f = 100\text{Hz}$	–	5.8	–	dB
			$f = 1\text{kHz}$	–	2.0	–	dB
			$f = 10\text{kHz}$	–	1.1	–	dB
			$f = 100\text{kHz}$	–	0.6	–	dB
Inter-Amplifier Audio Separation “Crosstalk”	CT	$V_{\text{CC}} = 12\text{V}, f = 1\text{kHz}, 0\text{dB} = 0.78\text{V}$	–	<–45	–	dB	
Inter-Amplifier Capacitance (Any amplifier output to any <i>other</i> amplifier input)	C	$V_{\text{CC}} = 12\text{V}, f = 1\text{MHz}$	–	<0.02	–	pF	

Note 1. Pin3, Pin7, Pin10, and Pin14 are bypassed to GND.

Pin Connection Diagram

