

## NTE724 Integrated Circuit Differential/Cascode Amplifier

**Description:**

The NTE724 is a differential/cascode amplifier in an 8-Lead TO5 type metal can package designed for use in communications and industrial equipment operating at frequencies from dc to 120MHz.

**Features:**

- Controlled for Input Offset Voltage, Input Offset Current, and Input Bias Current
- Balanced Differential Amplifier Configuration with Controlled Constant-Current Source
- Single and Dual-Ended Operation

**Applications:**

- RF and IF Amplifiers (Differential or Cascode)
- DC, Audio, and Sense Amplifiers
- Converter in the Commercial FM Band
- Oscillator
- Mixer
- Limiter

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

Power Dissipation ( $T_A \leq +85^\circ\text{C}$ ),  $P_D$  ..... 450mW  
 Derate Linearly Above  $85^\circ\text{C}$  ..... 5mW/ $^\circ\text{C}$   
 Operating Ambient Temperature Range,  $T_{opr}$  .....  $-55^\circ$  to  $+125^\circ\text{C}$   
 Storage Temperature Range,  $T_{stg}$  .....  $-65^\circ$  to  $+150^\circ\text{C}$   
 Lead Temperature (During Soldering, 1/16" from case, 10sec max),  $T_L$  .....  $+265^\circ\text{C}$

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = +12\text{V}$ ,  $V_{EE} = -12\text{V}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Bias Current	$I_{II}$	$V_{CC} = +6\text{V}$ , $V_{EE} = -6\text{V}$	-	16.6	70.0	$\mu\text{A}$
			-	36	106	$\mu\text{A}$
Quiescent Operating Current	$I_6$ or $I_8$	$V_{CC} = +6\text{V}$ , $V_{EE} = -6\text{V}$	0.8	1.25	2.0	mA
			2.0	3.3	5.0	mA
AGC Bias Current (Into Constant Current Source Pin7)	$I_7$	$V_{CC} = 12\text{V}$ , $V_{AGC} = 9\text{V}$	-	1.28	-	mA
		$V_{CC} = 12\text{V}$ , $V_{AGC} = 12\text{V}$	-	1.65	-	mA

**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$ ,  $V_{CC} = +12\text{V}$ ,  $V_{EE} = -12\text{V}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit		
Input Current (Pin7)	$I_7$	$V_{CC} = +6\text{V}$ , $V_{EE} = -6\text{V}$	0.5	0.85	1.0	mA		
			1.0	1.65	2.1	mA		
Device Dissipation	$P_T$	$V_{CC} = +6\text{V}$ , $V_{EE} = -6\text{V}$	24	36	54	mW		
			120	175	260	mW		
Power Gain	$G_P$	$V_{CC} = 9\text{V}$ , $f = 100\text{MHz}$	Cascode	16	20	–	dB	
			Differential Amp	14	17	–	dB	
		$V_{CC} = 9\text{V}$ , $f = 10.7\text{MHz}$	Cascode	35	39	–	dB	
			Differential Amp	28	32	–	dB	
Noise Figure	NF	$V_{CC} = 9\text{V}$ , $f = 100\text{MHz}$	Cascode	–	7.2	9.0	dB	
			Differential Amp	–	6.7	9.0	dB	
Power Output (Untuned)	$P_O$	$V_{CC} = 9\text{V}$ , $f = 10.7\text{MHz}$	Diff. Amp 50Ω Input–Output		–	5.7	–	μW
AGC Range	AGC		Differential Amp		–	62	–	dB
Voltage Gain	A	$V_{CC} = 0\text{V}$ , $f = 10.7\text{MHz}$ $R_L = 1\text{k}\Omega$	Cascode		–	40	–	dB
			Differential Amp		–	30	–	dB
Peak-to-Peak Output Current	$I_{P-P}$	$V_{CC} = 9\text{V}$	Differential Amp, $f = 10.7\text{MHz}$ , $e_{in} = 400\text{mV}$		2.0	4.0	7.0	mA
		$V_{CC} = 12\text{V}$			3.5	6.0	10.0	mA

**Pin Connection Diagram**  
(Top View)



