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NTE780 Integrated Circuit TV Automatic Fine-Tuning Subsystem

Descriptor:

The NTE780 represents the third generation of integrated circuits designed primarily for AFC (Auto-matic-Frequency-Control) applications. This device provides all of the signal-processing components needed (with the exception of the tuned-phase-detector transformer) to derive the AFT correction signals from the output of the video-if amplifier. The NTE780 is supplied in the 10-Lead TO5 style package, and operates over the temperature range of -55° to +125°C.

NTE780 is functionally similar to the NTE711 but embodies a higher-gain input amplifier which provides a 20-dB improvement in sensitivity. The increased sensitivity extends the application of a proven AFT system to the low-level IF-amplifier stages in TV receivers.

Features:

- Cascode Type High-Gain Amplifier (18mV input for rated output)
- Internal Voltage Regulator
- Differential Detector
- For use with either color or monochrome
- Differential Amplifier
- Bipolar Outputs
- Wide Operating-Temperature Range: -55° to +125°C

Absolute Maximum Ratings:

Device Dissipation ($T_A \leq +25^\circ\text{C}$), P_D 700mW
 Derate Above +25°C 5.6mW/°C
 Operating Ambient Temperature Range, T_{opr} -55° to +125°C
 Storage Temperature Range, T_{stg} -65° to +150°C
 Lead Temperature (During Soldering, 1/16" from Case, 10sec Max), T_L +265°C

Electrical Characteristics: ($V_+ = 30V$, $T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Device Dissipation	P_D	$R_S = 1.5k\Omega$	130	140	150	mW
Current Drain at 10.5 Volts	I_T	$V_{10} = 10.5V$	4	6.5	9.5	mA
Zener Regulated Voltage	V_{10}	$R_S = 1.5k\Omega$	10.9	11.8	12.8	V
Quiescent Operating Current	I_2		1	2	4	mA
Quiescent Operating Voltage	V_4		5	6.9	8	V
	V_5		5	6.9	8	V
Output Offset Voltage	V_{4-5}		-1	0	1	V

Electrical Characteristics (Cont'd): ($V_+ = 30V$, $T_A = +25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Dynamic Characteristics (As RF Amplifier)						
Input Voltage Sensitivity	V_i Sensitivity	$V_i = 18mV$	Correction Voltage Output as shown in table below.			
Input Admittance	y_{11}	$f = 45.75MHz,$ $R_s = 1.5k\Omega$	-	$0.41 + j1.0$	-	mmho
Reverse Transfer Admittance	γ_{12}		-	$0 + j3.4$	-	μmho
Forward Transfer Admittance	γ_{21}		-	$24.5 - j29$	-	mmho
Output Admittance	γ_{22}		-	$0.04 + j0.9$	-	mmho

Output vs. Frequency Deviation – AFC

Correction–Control Voltage	V corr. 4	$V_i = 18mV_{RMS}$ $f_o = MHz$ as indicated	% of V_{10}		% of V_{10}	
		$45.750 - 0.030$	85	-	-	V
$45.750 + 0.030$	-	-	25	V		
$45.750 - 0.900$	80	-	-	V		
$45.750 + 0.900$	-	-	35	V		
$45.750 - 1.500$	-	-	80	V		
$45.750 + 1.500$	35	-	-	V		
V corr. 5	$45.750 - 0.030$	-	-	25	V	
	$45.750 + 0.030$	85	-	-	V	
	$45.750 - 0.900$	-	-	-	V	
	$45.750 + 0.900$	80	-	-	V	
	$45.750 - 1.500$	35	-	-	V	
	$45.750 + 1.500$	-	-	80	V	

Pin Connection Diagram
(Top View)



