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## NTE15003 Integrated Circuit PIF Subsystem for TV Receiver

**Description:**

The NTE15003 is a picture IF subsystem that provides 3-stage IF amplifier, Video Detector, black and white noise inverting circuits and AFT detector for a TV receiver.

The NTE15003 also provides internal fast response AGC with dual time constants for the IF amplifier stages and delayed AGC for an external RF amplifier stage. It is designed for FET top front-end (reverse AGC).

**Features:**

- High Input Sensitivity 3-Stage IF Amplifier: 58.75MHz 100µV<sub>RMS</sub> Type
- Gain Reduction with Excellent Stability: Reduction Range 65dB Typ
- Video Detector with Linear Characteristics
- Black and White Noise Inverting Circuits
- Balanced AFT Output
- Improved Fast AGC Response
- Delayed AGC Output for a Front-End FET Top Front-End
- Minimal External Components and Adjustments Required

**Absolute Maximum Ratings:** (T<sub>A</sub> = +25°C unless otherwise specified)

Supply Voltage (Pin11), V <sub>CC</sub> .....	15V
Open Loop Voltage (Pin14), V <sub>14</sub> .....	15V
Video DC Output Current (Pin12), I <sub>12</sub> .....	6mA
Power Dissipation , P <sub>D</sub> .....	1.4W
Derated Above 25°C .....	11.2mW/°C
Operating Temperature Range, T <sub>stg</sub> .....	-55° to +150°C
Storage Temperature Range, T <sub>opr</sub> .....	-20° to +165°C

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Recommended Supply Voltage	$V_{CC}$		10.8	12.0	13.2	V
Supply Current	$I_{CC}$	$V_{CC} = 12\text{V}$	42	51	63	mA
Video DC Output Voltage	$V_{12}$	$V_{CC} = 12\text{V}$	5.2	5.5	5.8	V
AFT DC Output Voltage	$V_5$	$V_{CC} = 12\text{V}, SW_1: \text{ON}, SW_2: \text{ON}$	5.3	6.8	8.3	V
	$V_6$	$V_{CC} = 12\text{V}, SW_1: \text{ON}, SW_2: \text{ON}$	5.3	6.8	8.3	V
AFC Output Offset Voltage	$V_5 - V_6$	$V_{CC} = 12\text{V}, SW_1: \text{ON}, SW_2: \text{ON}$	-1.5	0	+1.5	V
RF AGC Residual Output Voltage	$V_4 \text{ SAT}$	$V_{CC} = 12\text{V}, SW_3: 2, SW_4: 1$	-	-	0.5	V
RF AGC Leakage Current	$I_4 \text{ LEAK}$	$V_{CC} = 12\text{V}, SW_3: 1, SW_4: 1$	-	-	1.0	$\mu\text{A}$
Video Sensitivity		$V_{CC} = 12\text{V}, V_{12} = 0.8V_{P-P}, f_p = 58.75\text{MHz}, \text{AM}: 30\%$	50	100	220	$\mu\text{V}_{\text{rms}}$
AGC Range	$\Delta A \text{ (IF)}$	$V_{CC} = 12\text{V}, f_p = 58.75\text{MHz}, V_{14} = 11.5\text{V to } 4.0\text{V}$	60	65	-	dB
Sync Tip Level Voltage	$V_{\text{SYNC}}$	$V_{CC} = 12\text{V}, f_p = 58.75\text{MHz}$	2.3	2.5	2.7	V
Maximum Input Voltage	$V_{\text{IN Max}}$	$V_{CC} = 12\text{V}, f_p = 58.75\text{MHz}$	100	120	-	$\text{mV}_{\text{rms}}$
White Noise, Threshold Level	$V_{W \text{ TH}}$	$V_{CC} = 12\text{V}, f_p = 58.75\text{MHz}$	6.0	6.4	6.8	V
White Noise, Clamp Level	$V_{W \text{ CL}}$	$V_{CC} = 12\text{V}, f_p = 58.75\text{MHz}$	3.7	4.1	4.5	V
Black Noise, Threshold Level	$V_{B \text{ TH}}$	$V_{CC} = 12\text{V}, f_p = 58.75\text{MHz}$	1.4	1.6	1.8	V
Black Noise, Clamp Level	$V_{B \text{ CL}}$	$V_{CC} = 12\text{V}, f_p = 58.75\text{MHz}$	2.9	3.3	3.7	V
Video Frequency Response	$f_{\text{BW}}$	$f = 58.75\text{MHz}, \text{Sweep Generator}$	4.5	5.5	-	MHz
Carrier Suppression	CL	$SG_1 = 100\text{mV}_{\text{rms}}, SG_2, SG_3: \text{OFF}$	40	50	-	dB
2 <sup>nd</sup> Carrier Suppression	$I_{2\text{nd}}$	$SG_1 = 100\text{mV}_{\text{rms}}, SG_2, SG_3: \text{OFF}$	40	50	-	dB
920kHz Carrier Beat Suppression	$I_{920}$	$SG_1 = 100\text{mV}_{\text{rms}}, SG_2 = 32\text{mV}_{\text{rms}}, SG_3 = 32\text{mV}_{\text{rms}}$	33	38	-	dB
Differential Phase	DP		-	3.5	5.0	deg
Differential Gain	DG		-	7	10	%
Input Impedance	$R_{\text{IN}}$	$f = 58.75\text{MHz}$ Between Pin1 and Pin16	3.0	4.5	6.0	$\text{k}\Omega$
	$C_{\text{IN}}$		-	2.0	5.0	pF
AFT Sensitivity		$f = 58.75\text{MHz}$	-	16	-	$\text{kHz/V}$
AFT Output Upper Voltage	$V_5, V_6 \text{ U}$	$f = 58.75\text{MHz}$	11.7	11.9	12.0	V
AFT Output Lower Voltage	$V_5, V_6 \text{ L}$	$f - 58.75\text{MHz}$	1.8	2.3	2.8	V
Maximum Available Current	$I_4 \text{ Max}$		0.3	-	-	mA

### Pin Connection Diagram

