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NTE15003
Integrated Circuit
PIF Subsytem 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_{RMS} 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_A = +25°C unless otherwise specified)

Supply Voltage (Pin11), V_{CC} 15V
Open Loop Voltage (Pin14), V_{14} 15V
Video DC Output Current (Pin12), I_{12} 6mA
Power Dissipation , P_D 1.4W
Derated Above 25°C . . . . . 11.2mW/°C
Operating Temperature Range, T_{stg} . . . . . –55° to +150°C
Storage Temperature Range, T_{opr} . . . . . –20° to +165°C

Electrical Characteristics: (T_A = +25°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} = 12V	42	51	63	mA
Video DC Output Voltage	V_{12}	V_{CC} = 12V	5.2	5.5	5.8	V
AFT DC Output Voltage	V_5	V_{CC} = 12V, SW_1: ON, SW_2: ON	5.3	6.8	8.3	V
	V_6	V_{CC} = 12V, SW_1: ON, SW_2: ON	5.3	6.8	8.3	V
AFC Output Offset Voltage	V_5–V_6	V_{CC} = 12V, SW_1: ON, SW_2: ON	–1.5	0	+1.5	V
RF AGC Residual Output Voltage	V_4 SAT	V_{CC} = 12V, SW_3: 2, SW_4: 1	–	–	0.5	V
RF AGC Leakage Current	I_4 LEAK	V_{CC} = 12V, SW_3: 1, SW_4: 1	–	–	1.0	µA
Video Sensitivity		V_{CC} = 12V, V_{12} = 0.8V_{P-P}, f_p = 58.75MHz, AM: 30%	50	100	220	µV_{rms}
AGC Range	ΔA (IF)	V_{CC} = 12V, f_p = 58.75MHz, V_{14} = 11.5V to 4.0V	60	65	–	dB
Sync Tip Level Voltage	V_{SYNC}	V_{CC} = 12V, f_p = 58.75MHz	2.3	2.5	2.7	V
Maximum Input Voltage	V_{IN} Max	V_{CC} = 12V, f_p = 58.75MHz	100	120	–	mV_{rms}
White Noise, Threshold Level	$V_{W\ TH}$	V_{CC} = 12V, f_p = 58.75MHz	6.0	6.4	6.8	V
White Noise, Clamp Level	$V_{W\ CL}$	V_{CC} = 12V, f_p = 58.75MHz	3.7	4.1	4.5	V
Black Noise, Threshold Level	$V_{B\ TH}$	V_{CC} = 12V, f_p = 58.75MHz	1.4	1.6	1.8	V
Black Noise, Clamp Level	$V_{B\ CL}$	V_{CC} = 12V, f_p = 58.75MHz	2.9	3.3	3.7	V
Video Frequency Response	f_{BW}	f = 58.75MHz, Sweep Generator	4.5	5.5	–	MHz
Carrier Suppression	CL	SG_1 = 100mV_{rms}, SG_2, SG_3: OFF	40	50	–	dB
2nd Carrier Suppression	I_{2nd}	SG_1 = 100mV_{rms}, SG_2, SG_3: OFF	40	50	–	dB
920kHz Carrier Beat Suppression	I_{920}	SG_1 = 100mV_{rms}, SG_2 = 32mV_{rms}, SG_3 = 32mV_{rms}	33	38	–	dB
Differential Phase	DP		–	3.5	5.0	deg
Differential Gain	DG		–	7	10	%
Input Impedance	R_{IN}	f = 58.75MHz Between Pin1 and Pin16	3.0	4.5	6.0	kΩ
	C_{IN}		–	2.0	5.0	pF
AFT Sensitivity		f = 58.75MHz	–	16	–	kHz/V
AFT Output Upper Voltage	V_5, V_6 U	f = 58.75MHz	11.7	11.9	12.0	V
AFT Output Lower Voltage	V_5, V_6 L	f – 58.75MHz	1.8	2.3	2.8	V
Maximum Available Current	I_4 Max		0.3	–	–	mA

Pin Connection Diagram