TDA 440

VIDEO IF AMPLIFIER/DEMODULATOR

The TDA440 incorporates the following functions:

1. Three-stage symmetrical IF (broad band) amplifier with first and second stages AGC-controlled.
2. Controlled video carrier demodulator.
3. Video drive amplifier with low-pass response and output independent of supply fluctuations.
4. Gated AGC section for IF amplifier.
5. Delayed regulated output voltage for the tuner preamplifier.

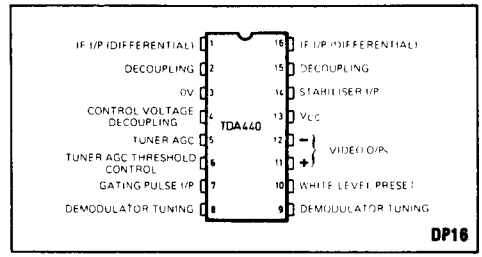


Fig. 1 Pin connections.

FEATURES

- High Gain – High Stability
- Constant Input Impedance Independent of AGC
- Low Noise Independent of AGC
- High Supply Rejection
- Low RF Breakthrough to Video O/Ps
- Fast AGC Action
- Very Low Intermodulation Products
- Minimum Differential Error
- Positive and Negative Video O/Ps
- Low Impedance Video O/Ps
- Temperature Compensated
- Peak White Adjustable

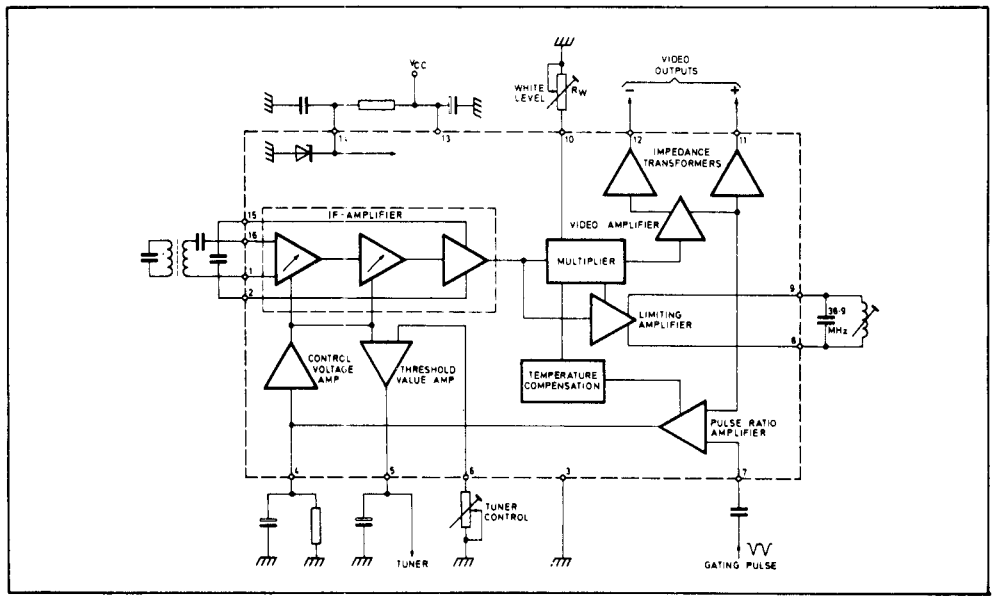
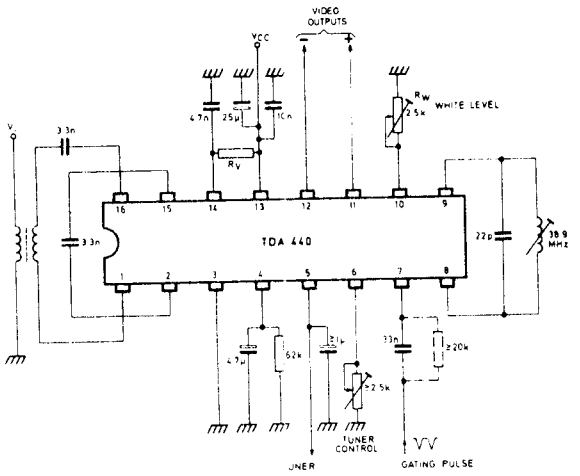


Fig. 2 TDA440 block diagram.

ABSOLUTE MAXIMUM RATINGS

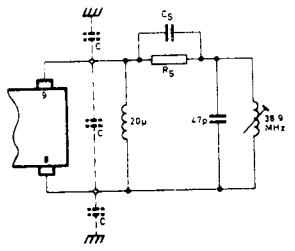
Reference point is pin 3

Rating	Pin	Symbol	Value	Units
Supply voltage range	13	V_{CC}	10 to 15	V
Low voltage stabiliser supply current	14	I_s	50	mA
Open loop voltage	5	V_5	15	V
Video DC output current				
Average positive	12	I_{12}	5	mA
Peak positive	12	I_{12}	30	mA
Average negative	11	I_{11}	5	mA
Peak negative	11	I_{11}	30	mA
White level control	10	V_{10}	3.2	V
Power dissipation at $T_{amb} \leqslant 55°C$		P_{tot}	700	mW
Ambient temperature range		T_{amb}	−10 to +65	°C
Storage temperature range		T_{stg}	−55 to +125	°C



Supply voltage *must be disconnected* before inserting the integrated circuit into the test socket.

Fig. 3 Test and application circuit.



C = Parasitic capacitance at pins 8 and 9 should be kept to a minimum.
C_S = 6 to 10pF series capacitance.
f_o = Series resonant frequency = 38.9 − (1.8 to 2.75) MHz.
R_S = Series resonance damping (determines tuning characteristics) = 1.8 to 3.3kΩ E.G., with R_S = 2.4kΩ, tuning range, f_r = 3MHz.

Fig. 4 Modifications to Fig. 3 for improving audio interference and cross-colour characteristics.

ELECTRICAL CHARACTERISTICS

Test Conditions (unless otherwise stated):
T_{amb} = +25°C
V_{CC} = +12V
Reference point is pin 3

Characteristic	Pin	Value			Units	Conditions
		Min.	Typ.	Max.		
Supply voltage, V_{CC}	13	10	12	15	V	
Supply current, I_{13}	13	15	19	25	mA	
Supply voltage, stabiliser input	14	5.5	5.8	6.4	V	I_{14} = 40mA
Positive video DC output voltage	11		5.5		V	
White level adjustment range for positive video DC output voltage	11			4.8	V	R_w (pin 10) = ∞
		6.5			V	R_w (pin 10) = 0
Peak black clamping level for positive video DC output voltage	11	1.75	1.9	2.15	V	
DC output current	11		3.2		mA	Reference point pin 13
Negative video DC output voltage	12		5.6		V	
Available tuner control current	5	7	7.5		mA	10dB after onset of tuner control action
Negative gating pulse	7	1.5	3	5	Vp-p	
Composite video output level	11		3.3		Vp-p	V_{11} = 5.5VDC
			4.2		Vp-p	V_{11} = 6.4VDC
AGC range, ΔAGC		50	56		dB	
Video 3dB bandwidth		8	10		MHz	
Video frequency response change			1.0	2.0	dB	ΔAGC = 50dB, video bandwidth = 0 to 5 MHz
Symmetrical input voltage for 3.3Vp-p output (pin 11)	1-16	100	150	220	μVr.m.s	
Maximum IF voltage level present at video outputs over the full AGC range	11,12			30	mV	f = 38.9MHz
				50	mV	f = 77.8MHz (2nd harmonic)
Sound IF voltage level present at video outputs with selective circuit	12	30			mV	f = 5.5MHz, $\frac{\text{picture carrier level}}{\text{sound carrier level}}$ = 30dB
Differential gain of negative comp. video output signal for full black to white swing				15	%	
Suppression of sound carrier/colour subcarrier (1.07MHz) w.r.t colour subcarrier level		40			dB	Picture carrier = 0dB, IF colour subcarrier level = −6dB, IF sound carrier level = −24dB
Input impedance	1					Reference point pin 16
AGC max.			1.4//2		kΩ//pF	
AGC min.			1.4//1.9		kΩ//pF	