SGS-THOMSON MICROELECTRONICS

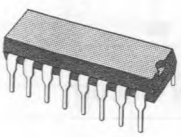
TDA2540 TDA2541

IF AMPLIFIER WITH DEMODULATOR AND AFC

- SUPPLY VOLTAGE : 12 V TYP
- SUPPLY CURRENT : 50 mA TYP
- I.F. INPUT VOLTAGE SENSITIVITY AT F = 38.9 MHz : 85 μV_{RMS} TYP
- VIDEO OUTPUT VOLTAGE (white at 10 % of top synchro) : 2.7 V_{pp} TYP
- I.F. VOLTAGE GAIN CONTROL RANGE : 64 dB TYP
- SIGNAL TO NOISE RATIO AT V_I = 10 mV : 58 dB TYP
- A.F.C. OUTPUT VOLTAGE SWING FOR Δf = 100 kHz : 10 V TYP

They incorporate the following functions :

- Gain controlled amplifier
- Synchronous demodulator
- White spot inverter
- Video preamplifier with noise protection
- Switchable AFC
- AGC with noise gating
- Tuner AGC output (NPN tuner for 2540)-(PNP tuner for 2541)
- VCR switch for video output inhibition (VCR play back)

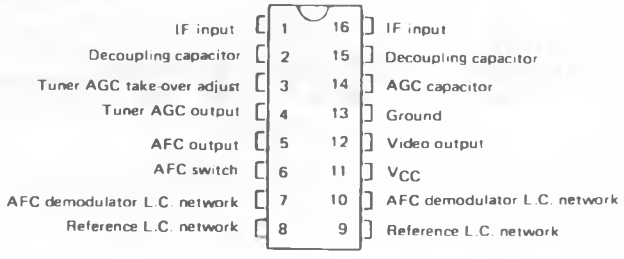


TDA2540-TDA2541
DIP16
(Plastic Package)

DESCRIPTION

The TDA2540 and 2541 are IF amplifier and A.M. demodulator circuits for colour and black and white television receivers using PNP or NPN tuners. They are intended for reception of negative or positive modulation CCIR standard.

PIN CONNECTIONS



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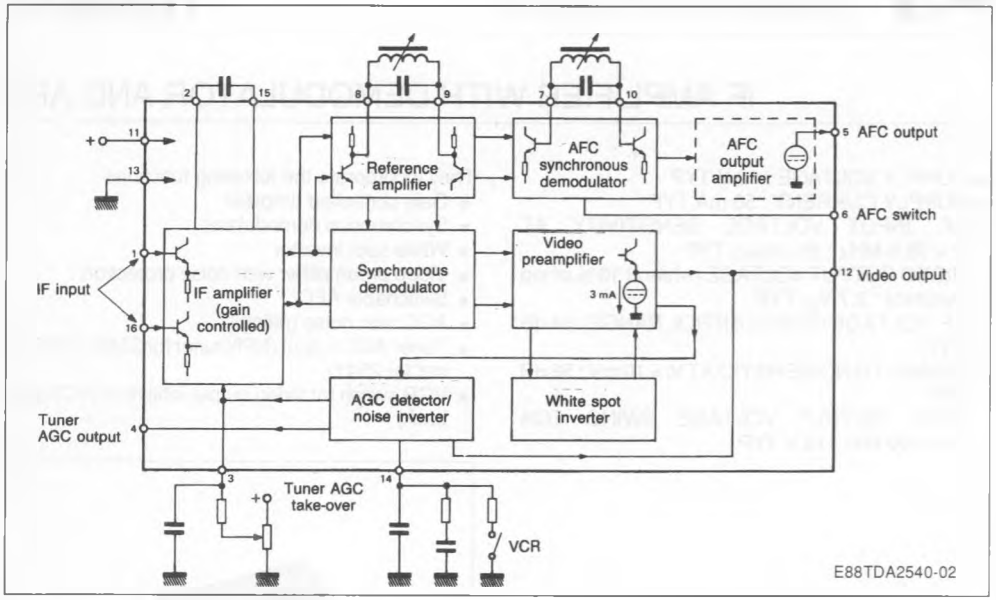
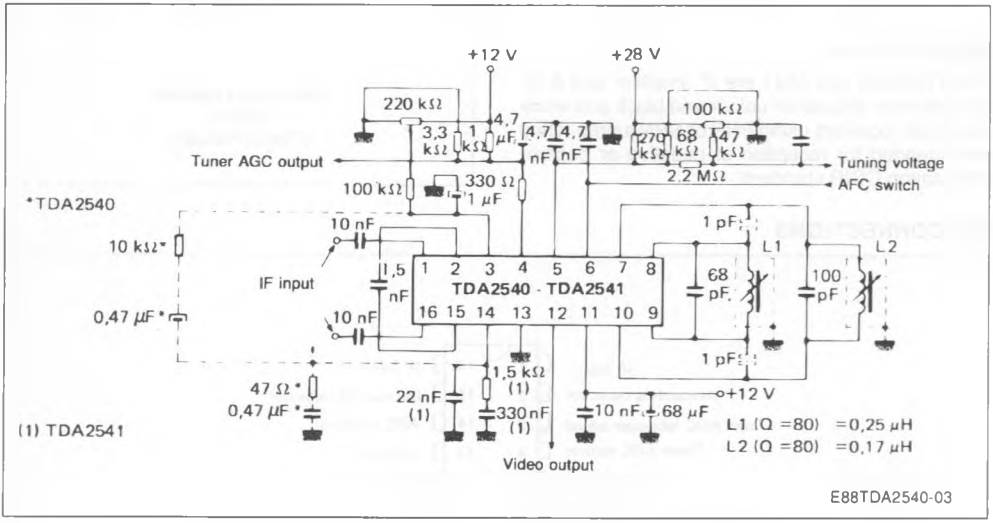
BLOCK DIAGRAM



APPLICATION CIRCUIT



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V (11–13)	Supply Voltage	13.8	V
V (4–13)	Tuner A.G.C. Voltage	12	V
P_{tot}	Power Dissipation	900	mW
T_{stg}	Storage Temperature	– 55 to + 125	°C
T_{amb}	Operating Ambient Temperature	0 to + 70	°C

THERMAL DATA

$R_{th}(j\text{-}a)$	Junction - ambient Thermal Resistance	70	°C/W

ELECTRICAL OPERATING CHARACTERISTICS

T_{amb} = 25 °C; V (11 – 13) = 12 V; f = 38.9 MHz (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V (11-13)	Supply Voltage Range	10.2	12	13.8	V
I_{11}	Supply Current		50	60	mA
V (1-16)	IF Input Voltage Sensitivity	60	85	180	μVRMS
	Max Input Voltage (pins 1-16)		140		mV
V (12-13)	Video Output Voltage		2.7		V_{pp}
Z (1-16)	Differential Input Impedance (in parallel with 2 pF)		2		kΩ
V (12-13)	Zero Signal Output Level	5.7	6	6.3	V
V (12-13)	Top Synchro Output Level	2.9	3.07	3.2	V
ΔG_V	IF Voltage Gain Control Range	52	64		dB
S/N	Signal to Noise Ratio (V_I = 10 mV) (see note 1)	50	58		dB
B	Bandwidth of Video Amplifier (– 3 dB)		6		MHz
dG	Differential Gain		4	10	%
dϕ	Differential Phase		2	10	%
V (12-13)	Carrier Signal at Video Output (V_I = 10 mV)		4	30	mVRMS
V (12-13)	2nd Harmonic of Carrier at Video Output (V_I = 10 mV)		20	30	mVRMS
	Intermodulation at 1.1 MHz (blue) (see figures 2 and 3)	46	60		dB
	Intermodulation at 1.1 MHz (yellow) (see figures 2 and 3)	46	50		dB
	Intermodulation at 3.3 MHz (blue) (see figures 2 and 3)	46	54		dB

Note : 1. $S/N = \frac{V_O \text{ (black to white)}}{V_N \text{ . (RMS at B = 5 MHz)}}$ (dB)

ELECTRICAL OPERATING CHARACTERISTICS(continued)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V (14-13)	VCR Switches Off Output at : (VCR = low Level)			1.1	V
	White Spot Inverter Threshold Level (see figure 1)		6.6		V
	White Spot Insertion Level (see figure 1)		4.7		V
	Noise Inverter Threshold Level (see figure 1)		1.8		V
	Noise Insertion Level (see figure 1)		3.8		V
I 4	Tuner AGC output Current Range		0 to 10		mA
V (14-13)	Tuner AGC Output Voltage			0.3	V
I 4	Tuner AGC Output Leakage Current TDA2541 V 14-13 = 11 V V 4-13 = 12 V TDA2540 V 14-13 = 5 V V 4-13 = 12 V			15	µA
ΔV (5-13)	AFC Output Voltage Swing (Δf = 100 kHz)	10	11		V
Δf	Change of Frequency at AFC Output (voltage swing of 10 V)		100	200	kHz
V (6-13)	AFC Switches OFF (AFC = low level) at :			2.5	V
V (6-13)	AFC Switches LOW (AFC = High level) at :	3.2			V
V (5-13)	AFC Zero = Signal Output Voltage (minimum gain)	4	6	8	V

Note : 1. $S/N = \frac{V_O \text{ (black to white)}}{V_N \text{ . (RMS at B = 5 MHz)}}$ (dB)

Figure 1 : Video Output Waveform Showing White Spot and Noise Inverter Threshold Levels.

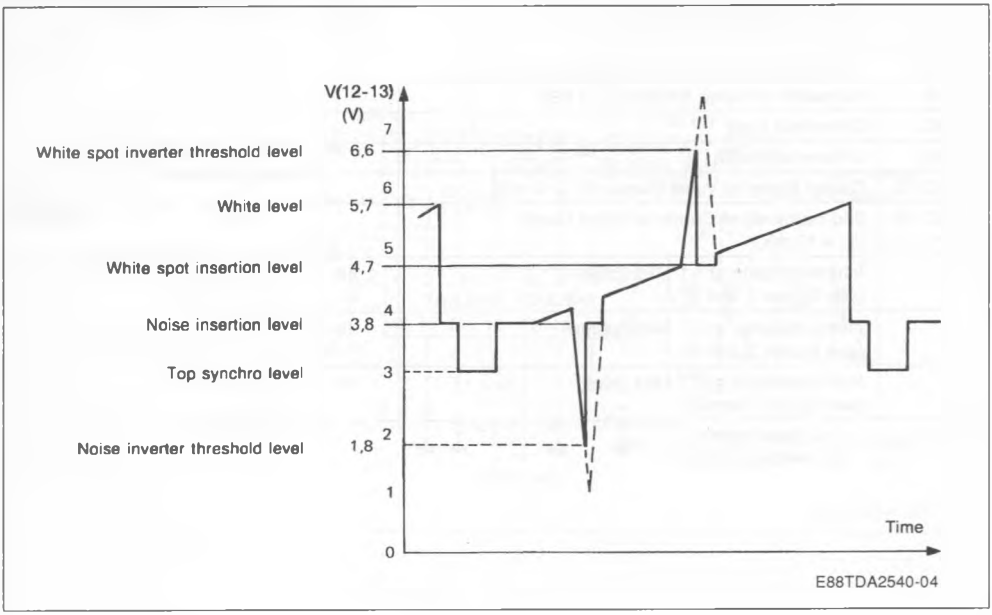


Figure 2 : Input Conditions for Intermodulation Measurements.

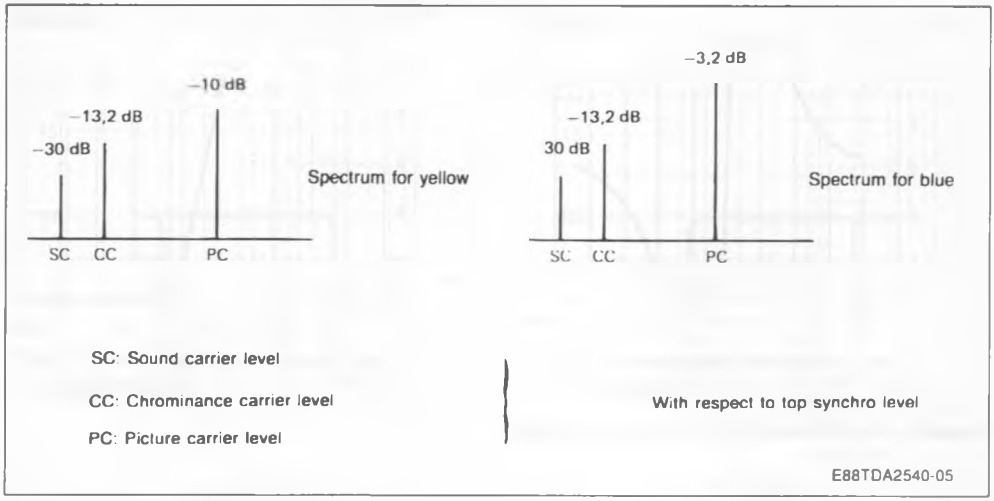


Figure 3 : Test Set-up for Intermodulation.

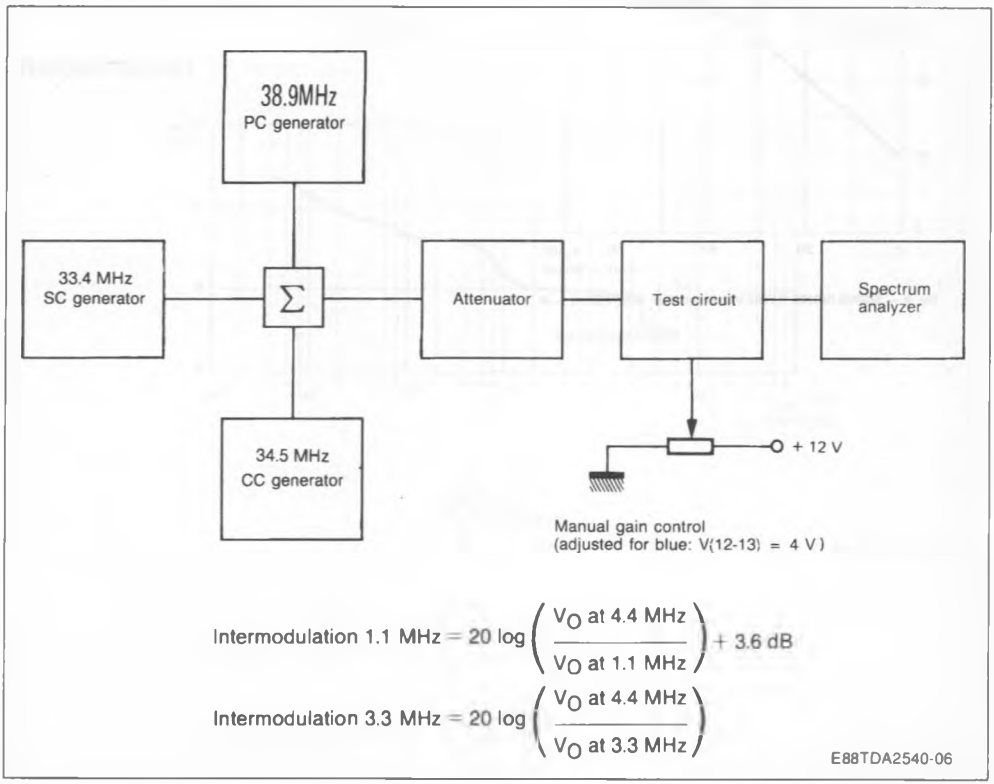


Figure 4 : AFC Voltage Versus Frequency V(5-13).

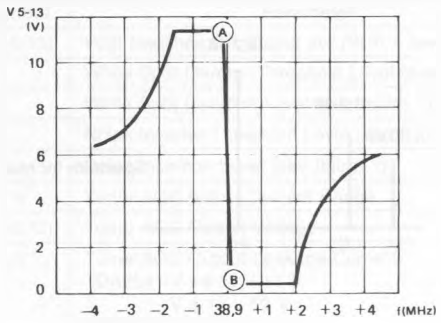


Fig. 4 — AFC VOLTAGE VERSUS FREQUENCY V 5-13

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Figure 5 : AFC Voltage Versus Frequency V(5-13).

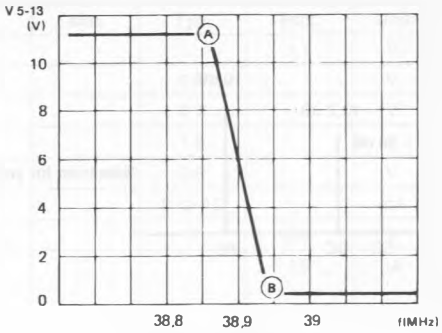

Fig. 5 — AFC VOLTAGE VERSUS FREQUENCY V 5-13

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Figure 6 : Signal/Noise Ratio Versus Input Voltage V(1-16).

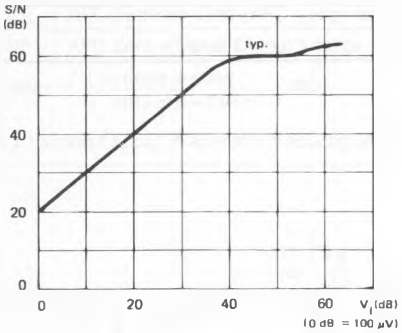

Fig. 6 — SIGNAL/NOISE RATIO VERSUS INPUT VOLTAGE V 1-16

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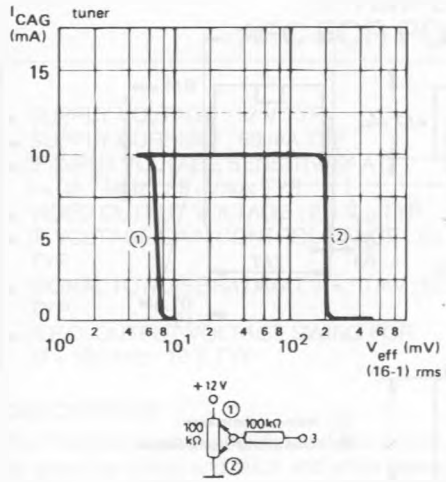
Figure 7 : AGC Tuner Current Curve.

TDA2540



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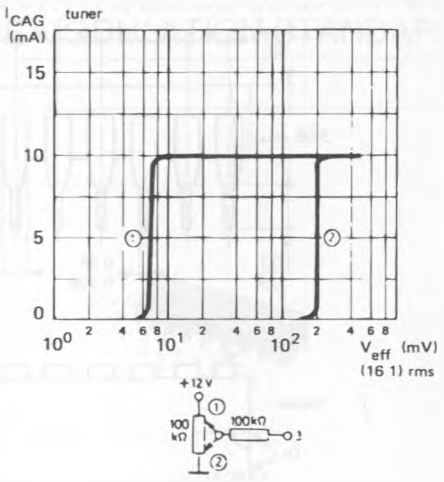
TDA2541



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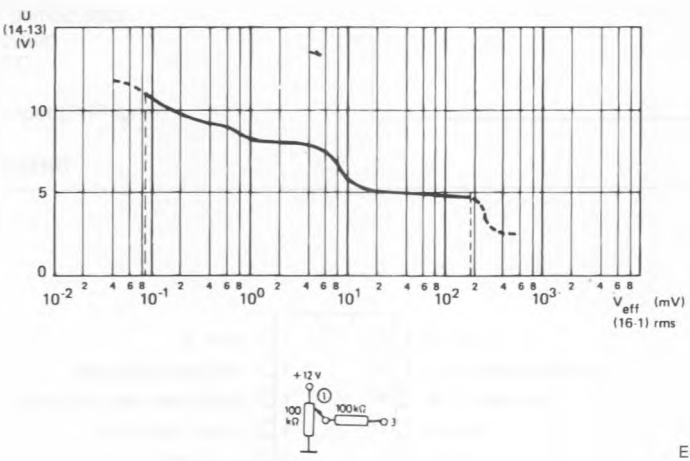
TDA2540-TDA2541



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PACKAGE MECHANICAL DATA

16 PINS – PLASTIC DIP