DATA SHEET

TDA3843

Sound-IF circuit for TV AM-sound standard L and L'

Product specification

File under Integrated Circuits, IC02

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Philips
Semiconductors

PHILIPS

Sound-IF circuit for TV AM-sound standard L and L'

TDA3843

GENERAL DESCRIPTION

The TDA3843 performs the AM-sound demodulation for the L- and L'-standard.

Features

- 5 to 8 V power supply and an alternative 12 V power supply

- Low power consumption (200 mW) at 5 V supply voltage

- New AC-coupled wideband IF-amplifier (high dynamic ranges, less intermodulation)

- In-phase wideband AM demodulator without external reference circuit

- Reduced THD figures even for low AF frequencies (typical 1%)

- Stabilizer circuit for ripple rejection and constant output signals

- All pins are ESD protected

QUICK REFERENCE DATA

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage (pin 14)	V_{P1}	4.5	5	8.8	V
Supply voltage (pin 11)	V_{P2}	10.8	12	13.2	V
Supply current	$I_{11, 14-13}$	–	40	48	mA
Minimum IF input (RMS value)	V_{1-16}	–	70	100	μV
IF control range	ΔG_V	60	63	–	dB
AF output signal (RMS value)	V_{6-13}	–	550	–	mV
Signal plus weighted-noise to weighted-noise ratio (CCIR 468-3)	$S + W/W$	50	56	–	dB

PACKAGE OUTLINE

16-lead DIL; plastic (opposite bent leads) (SOT38WBE); SOT38-1; 1996 December 4.

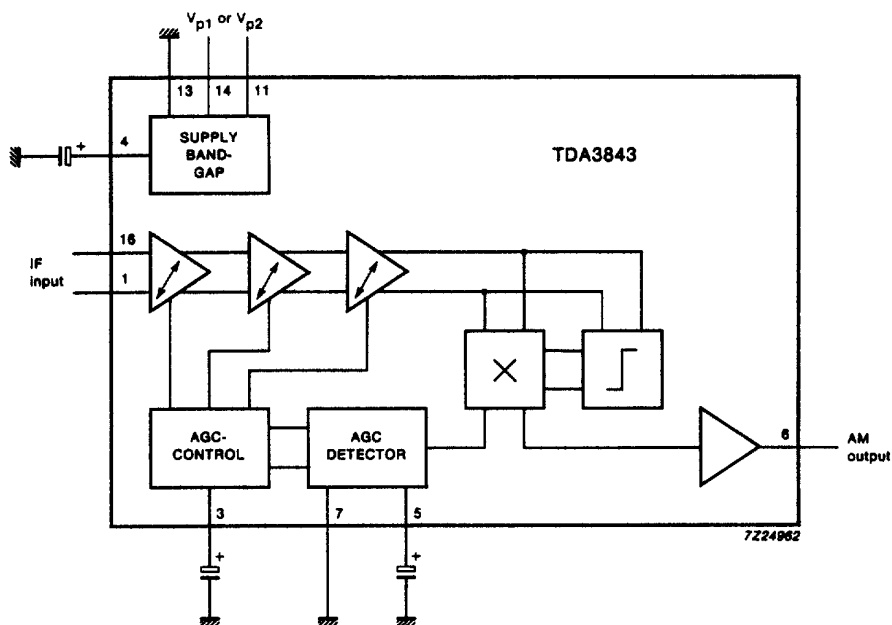Sound-IF circuit for TV AM-sound
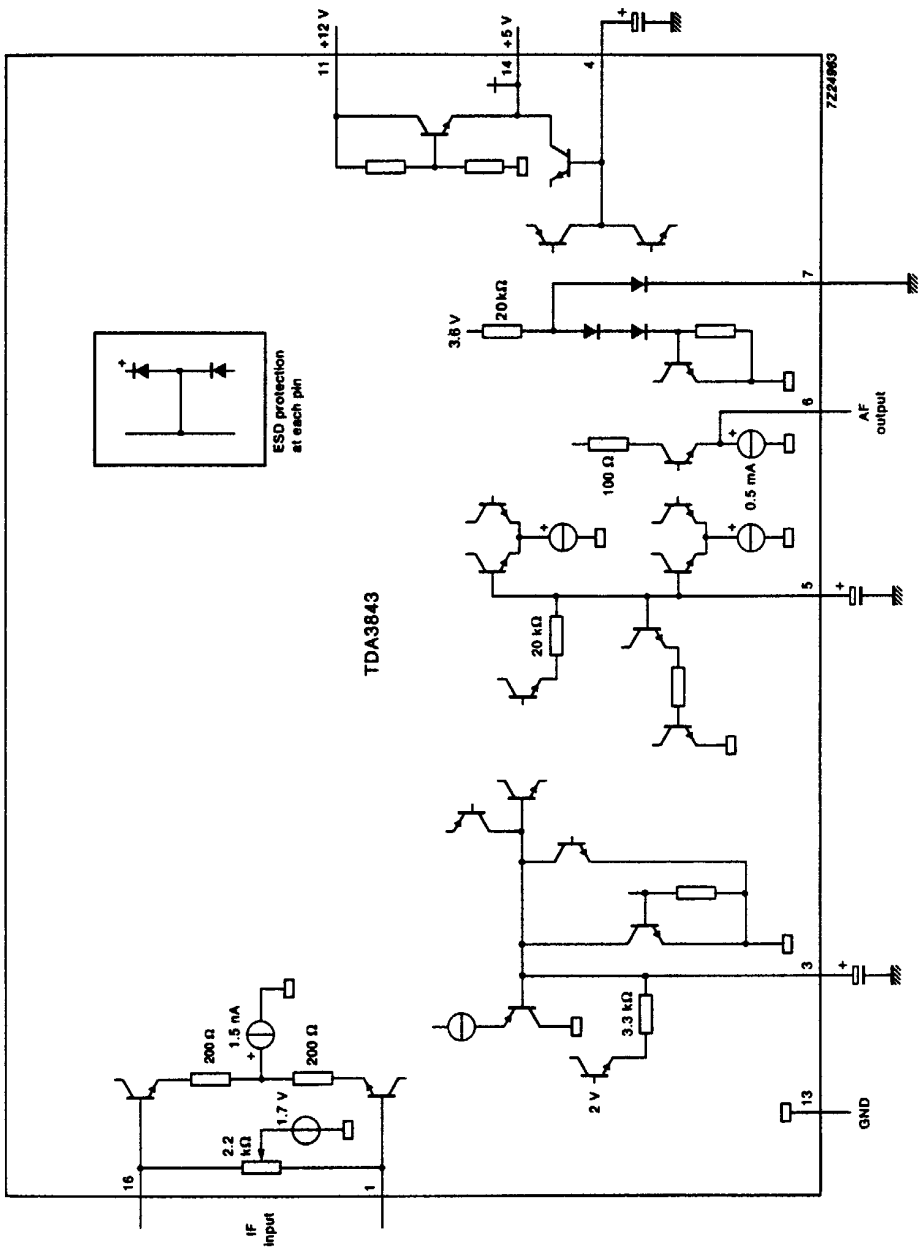standard L and L'

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Fig.1 Block diagram.

Fig.2 Input/output loading diagram.

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RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Supply voltage (pin 14)	V_{P1}	4.5	8.8	V
Supply voltage (pin 11)	V_{P2}	10.8	13.2	V
Operating ambient temperature range	T_{amb}	0	+ 70	°C
Storage temperature range	T_{stg}	−25	+ 125	°C
Total power dissipation at V_{P2}	P_{tot}	–	635	mW

CHARACTERISTICS

V_{P1} = 5 V (see note 1); T_{amb} = 25 °C; unless otherwise specified

PARAMETER	CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current consumption		I_{11}	–	40	48	mA
IF amplifier						
Input resistance		$R_{1\text{-}16}$	–	2	–	kΩ
Input capacitance		$C_{1\text{-}16}$	–	2.5	–	pF
Minimum IF input signal (RMS value)	note 2	$V_{1\text{-}16}$	–	70	100	µV
Maximum IF input signal (RMS value)	note 3	$V_{1\text{-}16}$	70	100	–	mV
Gain control range			60	63	–	dB
IF bandwidth	−3 dB		50	70	–	MHz
DC potential		$V_{1/16\text{-}3}$	–	1.7	–	V
AM demodulator	note 4					
AF output signal (RMS value)		$V_{6\text{-}13}$	440	550	660	mV
AF bandwidth	−3 dB, note 5	$V_{6\text{-}13}$	0.02	–	>100	kHz
Total harmonic distortion		THD	–	1	2	%
Signal plus weighted-noise to weighted-noise ratio (CCIR 468-3)	note 6	S+W/W	50	56	–	dB
DC potential		$V_{6\text{-}13}$	–	1.8	–	V
Output resistance	emitter follower with 0.5 mA bias current	R_6	–	200	–	Ω
Allowable AC output current (peak-to-peak value)	note 7	$\pm I_6$	–	–	0.3	mA
Allowable DC output current		$-I_6$	–	–	1	mA

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PARAMETER	CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Ripple rejection	$V_{ripple} < 200$ mV (peak-to-peak), 50 to 100 Hz, measured at 70 Hz					
AF signal output	$\alpha RR = V_{ripple}$ on $V_P/V_{ripple\ on}$ V_O	αRR	30	40	–	dB
IF filter						
Proposal for sound carrier filter for L-standard	Fig.5					

Notes to the characteristics

1. Using the power supply voltage range $V_{P1} = 5$ to 8 V, the performance will not essentially change. Using the power supply voltage range, $V_{P2} = 12$ V, the performance will be comparable with the performance at $V_{P1} = 5$ to 8 V. The unused power supply pin must not be connected.

2. Start of gain control (low IF input signal) at −3 dB AF signal reduction at pin 6.

3. End of gain control (high IF input signal) at +1 dB AF signal expansion at pin 6.

4. Sound carrier = 32.4 MHz modulated with f = 1 kHz and a modulation depth m = 80%.
   IF input signal $V_{1-16} = 10$ mV (RMS value).

5. A maximum value of 100 kHz is guaranteed, but, typically a maximum value of 700 kHz is found.

6. The capacitor at pin 4 may be omitted, but then the S+W/W figure will be degraded by up to 8 dB in the IF voltage range 1 mV up to 100 mV.

7. If a higher AC output current is required, an external resistor must be connected from the output to ground. This is to increase the bias current of the emitter follower (note, the maximum allowable DC output current).
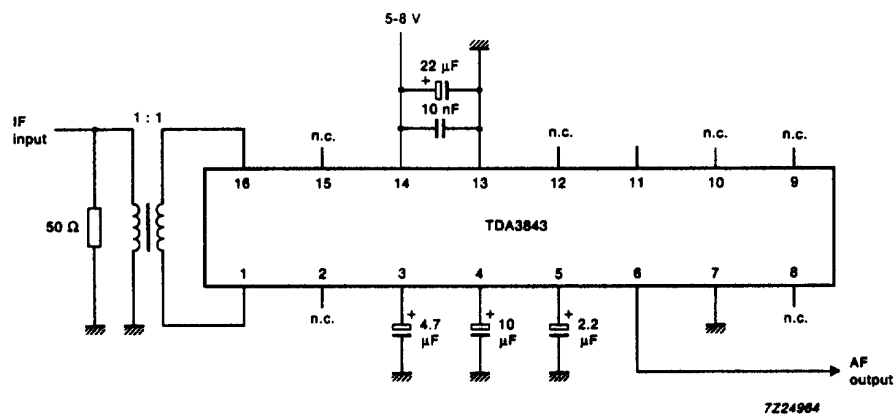
Fig.3 Test circuit, 5 V supply.
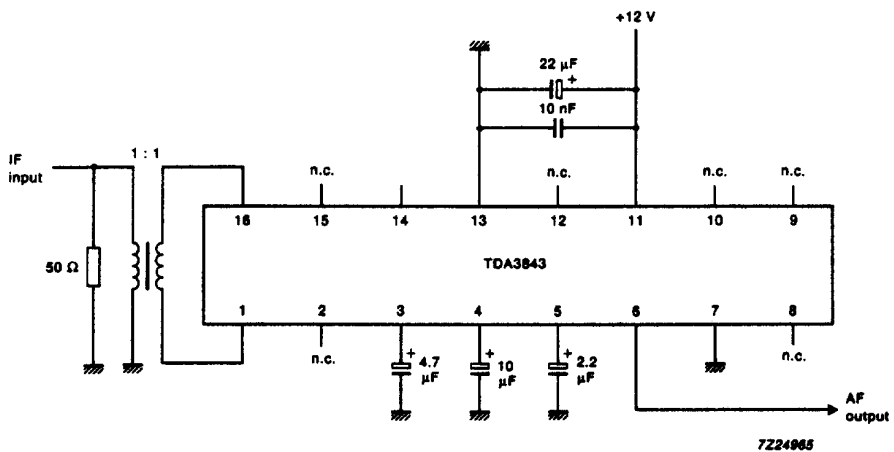
Fig.4 Test circuit, 12 V supply.
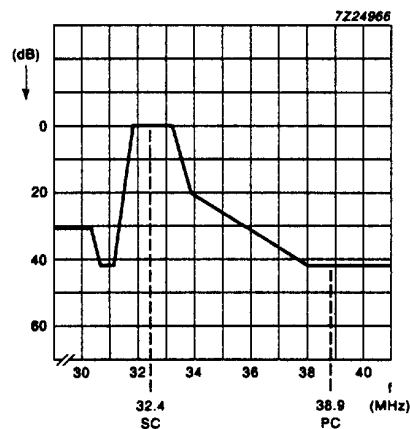
Where SC = sound carrier and PC = picture carrier.
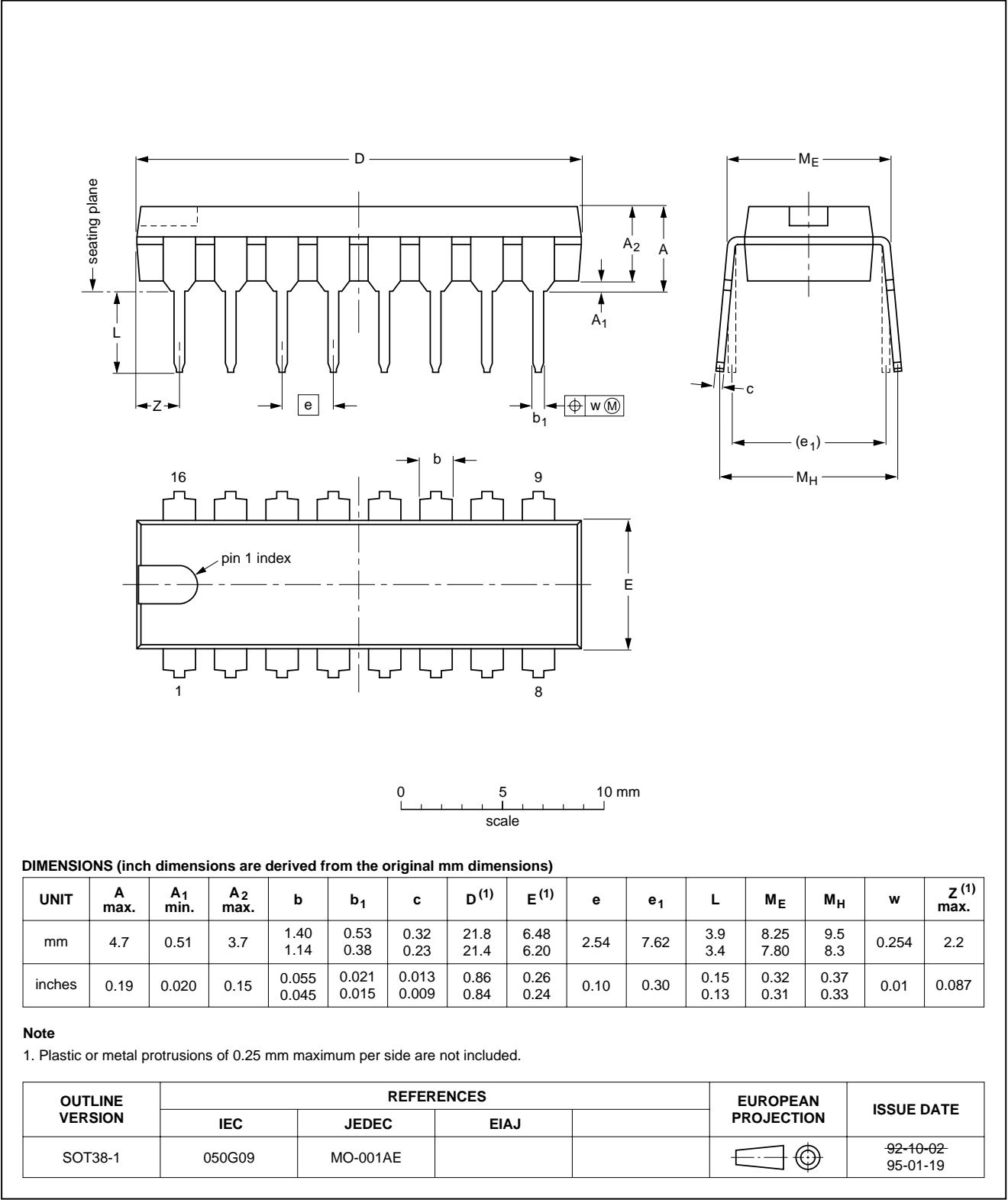
Fig.5 AM IF filter for standard L.

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PACKAGE OUTLINE

DIP16: plastic dual in-line package; 16 leads (300 mil); long body

SOT38-1

DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A₁ min.	A₂ max.	b	b₁	c	D (1)	E (1)	e	e₁	L	M_E	M_H	w	Z (1) max.
mm	4.7	0.51	3.7	1.40 1.14	0.53 0.38	0.32 0.23	21.8 21.4	6.48 6.20	2.54	7.62	3.9 3.4	8.25 7.80	9.5 8.3	0.254	2.2
inches	0.19	0.020	0.15	0.055 0.045	0.021 0.015	0.013 0.009	0.86 0.84	0.26 0.24	0.10	0.30	0.15 0.13	0.32 0.31	0.37 0.33	0.01	0.087

Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT38-1	050G09	MO-001AE				~~92-10-02~~ 95-01-19

SOLDERING

Introduction

There is no soldering method that is ideal for all IC packages. Wave soldering is often preferred when through-hole and surface mounted components are mixed on one printed-circuit board. However, wave soldering is not always suitable for surface mounted ICs, or for printed-circuits with high population densities. In these situations reflow soldering is often used.

This text gives a very brief insight to a complex technology. A more in-depth account of soldering ICs can be found in our *"IC Package Databook"* (order code 9398 652 90011).

Soldering by dipping or by wave

The maximum permissible temperature of the solder is 260 °C; solder at this temperature must not be in contact with the joint for more than 5 seconds. The total contact time of successive solder waves must not exceed 5 seconds.

The device may be mounted up to the seating plane, but the temperature of the plastic body must not exceed the specified maximum storage temperature ($T_{stg\ max}$). If the printed-circuit board has been pre-heated, forced cooling may be necessary immediately after soldering to keep the temperature within the permissible limit.

Repairing soldered joints

Apply a low voltage soldering iron (less than 24 V) to the lead(s) of the package, below the seating plane or not more than 2 mm above it. If the temperature of the soldering iron bit is less than 300 °C it may remain in contact for up to 10 seconds. If the bit temperature is between 300 and 400 °C, contact may be up to 5 seconds.

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

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