DATA SHEET

TDA2555
TDA2557
Dual TV sound demodulator circuits

Product specification
File under Integrated Circuits, IC02

March 1986

Philips
Semiconductors

PHILIPS

Dual TV sound demodulator circuits

TDA2555
TDA2557

GENERAL DESCRIPTION

The circuits incorporate two FM demodulator systems to perform the demodulator functions required in a dual sound carrier TV system for demodulating the sound carriers.
The difference between TDA2555 and TDA2557 is the number of stages of the limiting amplifier.

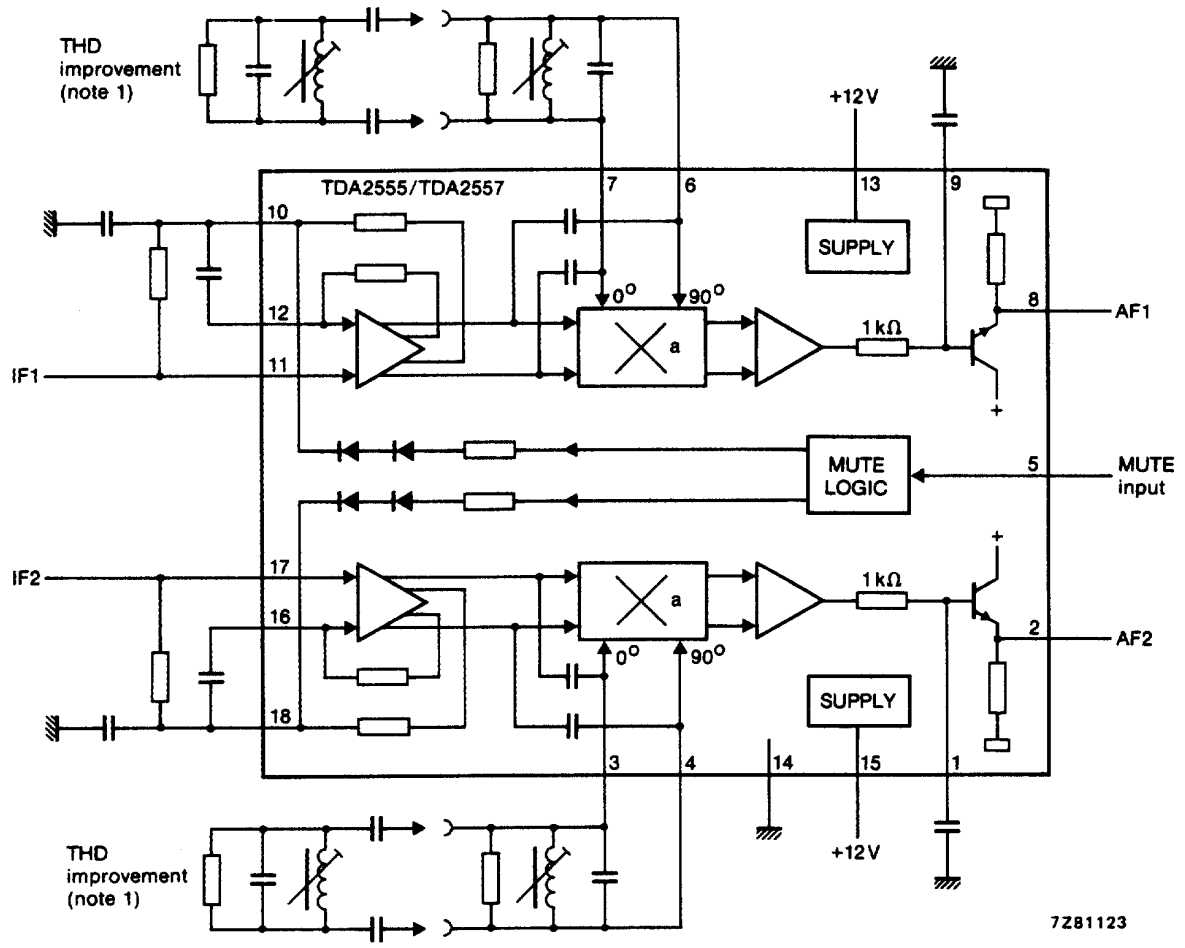
- **Eight** (TDA2555) or **five** (TDA2557) stage limiting amplifier
- Quadrature demodulator for FM detection
- De-emphasis stage
- Output amplifier
- Mute function for each FM demodulator

QUICK REFERENCE DATA

Supply voltage (pins 13 and 15)	V_P	typ.	12	V
Supply current (pins 13 and 15)	I_P	typ.	24,5	mA
AF output voltage (pins 2 and 8)	$V_{o(rms)}$	typ.	600	mV
Total harmonic distortion (note 1)	THD	<	0,1	%
Signal to weighted noise ratio	(S + N)/N	typ.	70	dB

PACKAGE OUTLINE

18-lead DIL; plastic (SOT102); SOT102-1; 1996 November 19.



a = QUADRATURE DEMODULATOR

Fig.1 Block diagram.
TDA2555 with 8-stage limiting amplifier;
TDA2557 with 5-stage limiting amplifier.

RATINGS

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

Supply voltage (pins 13 and 15)	V_P	max.	13,2	V
Total power dissipation	P_{tot}	max.	400	mW
Storage temperature range	T_{stg}	–40 to + 150		°C
Operating ambient temperature	T_{amb}	0 to + 70		°C

CHARACTERISTICS

$V_P = V_{13, 15-14} = 12$ V; $T_{amb} = 25$ °C; $f_{IF1} = 5{,}5$ MHz; $f_{IF2} = 5{,}74$ MHz; $f_{m1} = 1$ kHz; $\Delta f = \pm 30$ kHz;
$V_{i(rms)} = 5$ mV for TDA2555;
$V_{i(rms)} = 10$ mV for TDA2557;
see test circuit Fig.3, voltages with respect to ground (pin 14), unless otherwise specified.

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Total current consumption	$I_{13, 15}$	18	24,5	30	mA
LIMITING AMPLIFIER					
Maximum input voltage	$V_{11-12(rms)}$ $V_{16-17(rms)}$	–	200	–	mV
Input voltage for start of limiting (3 dB AF signal reduction)					
TDA2555	$V_{11-12(rms)}$ $V_{16-17(rms)}$	–	50	100	µV
TDA2557	$V_{11-12(rms)}$ $V_{16-17(rms)}$	–	250	500	µV
DC voltage (input limiting amplifier) pins 11, 12, 16, 17 to 14	V_i	–	2,0	–	V
DC voltage (feedback loop)	$V_{10,18-14}$	–	2,0	–	V
FM DEMODULATOR					
IF reference signal voltage	$V_{3-4(rms)}$ $V_{6-7(rms)}$	–	200	–	mV
DC voltage	$V_{3,4,6,7-14}$	–	3,1	–	V
AF output voltage	$V_{2-14(rms)}$	450	600	750	mV
Difference of output signals	$\frac{V_{2-14}}{V_{8-14}}$	–	$\pm 0{,}1$	$\pm 0{,}5$	dB
Total harmonic distortion at outputs AF1 and AF2 (note 1)	THD	–	–	0,5	%
A.M. suppression at outputs AF1 and AF2, $f_{FM} = 70$ Hz; $\Delta f = \pm 50$ kHz; $f_{AM} = 1$ kHz; m = 0,3	AMS	50	–	–	dB
Signal to noise ratio at outputs AF1 and AF2 (CCIR weighted, quasi peak)	(S + N)/N	65	70	–	dB
Residual IF-signal without de-emphasis	$V_{2,8-14(rms)}$	–	30	–	mV
Ripple rejection at outputs AF1 and AF2 f = 50 Hz to 20 kHz; $V_{i(rms)} = 200$ mV	RR	–	40	–	dB

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
AUDIO OUTPUT STAGE					
emitter follower with 1,0 mA bias current					
DC output voltage	$V_{2,8\text{-}14}$	3,0	4,0	5,0	V
External DC load resistance	$R_{2,8\text{-}14}$	2	–	–	kΩ
AC output current (note 2)	$-I_{2,8\text{-}14(p\text{-}p)}$	–	–	0,5	mA
De-emphasis input resistance (note 3)	$R_{1,9\text{-}14}$	0,8	1,0	1,2	kΩ
DC voltage (de-emphasis)	$V_{1,9\text{-}14}$	3,7	4,7	5,7	V
Crosstalk attenuation					
f = 1 kHz (note 4)	$\alpha_{12,21}$	60	–	–	dB
Crosstalk attenuation					
f = 10 kHz (note 4)	$\alpha_{12,21}$	60	–	–	dB
Output impedance	$R_{2,8\text{-}14}$	–	25	–	Ω
AF output level (Fig.2, note 5)					
MUTE function					
$V_{i(rms)} < 60$ mV	α	60	–	–	dB
Switching input current					
$V_{5\text{-}14} = 0$ V	$-I_5$	–	–	500	μA
$V_{5\text{-}14} = V_P$	I_5	–	–	500	μA
Internal d.c. voltage					
no mute (pin 5 not connected)	$V_{5\text{-}14}$	–	6,2	–	V

Notes to the characteristics

1. THD < 0,1% requires a double tuned demodulator circuit ($Q_L = 20$). With a single tuned circuit a THD of < 0,5% is possible (see Fig.1 and Fig.3).
2. If higher a.c. output current is required an external resistor must be applied from output (pins 2 and 8) to ground (min. 2 kΩ) in order to improve the THD performance ($-I_{2,8} < 4$ mA).
3. The de-emphasis time constant is 50 μs.
4. Crosstalk attenuation is defined as: $o_{12} = \frac{V_{2-14}\text{unmodulated}}{V_{8-14}}$ $o_{21} = \frac{V_{8-14}\text{unmodulated}}{V_{2-14}}$.
5. In the MUTE state the a.f. output level attenuation is more than 60 dB. The MUTE function is only guaranteed for an r.m.s. value of the input voltage lower than 60 mV. See also Fig.2.

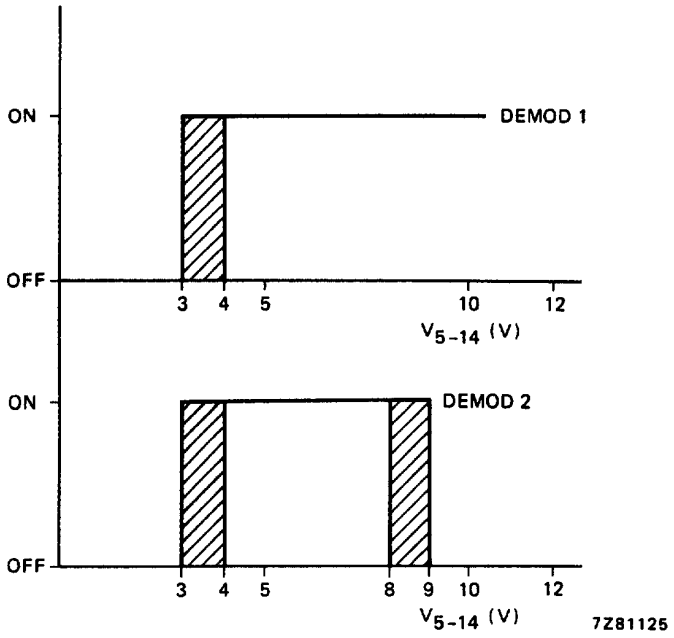


Fig.2 Mute function.

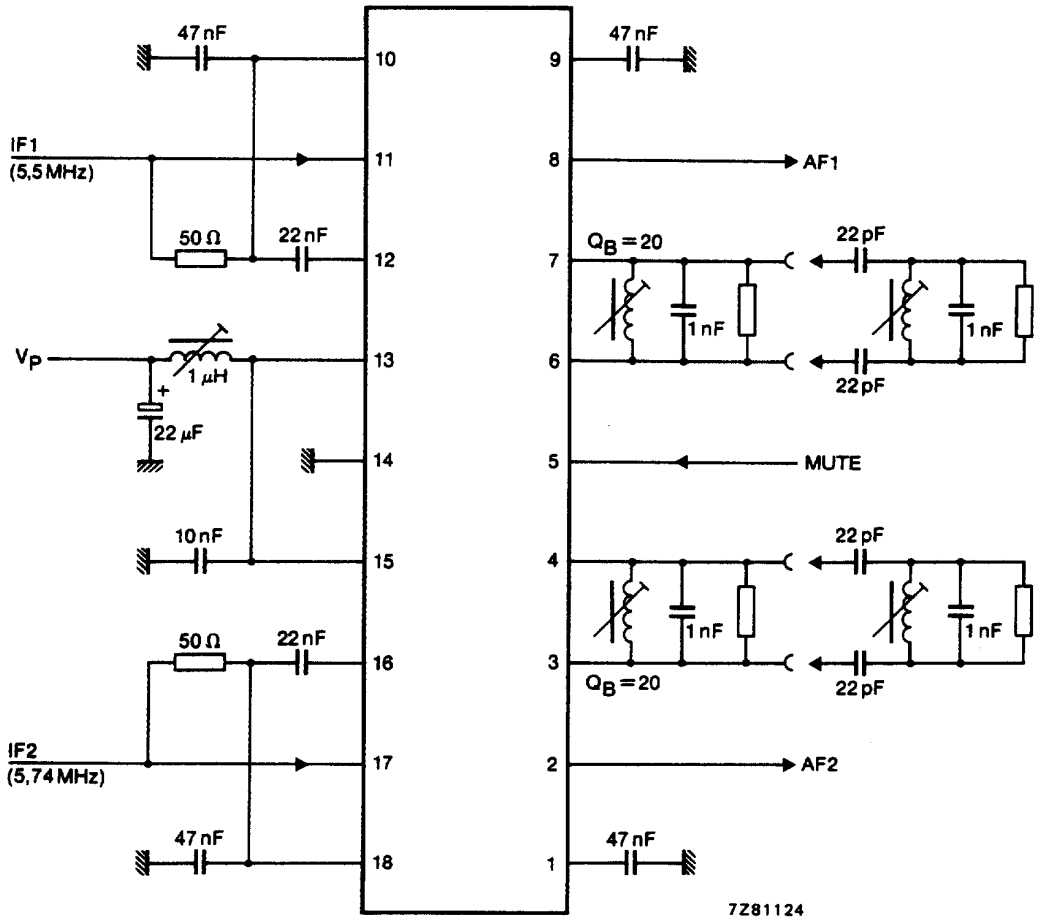
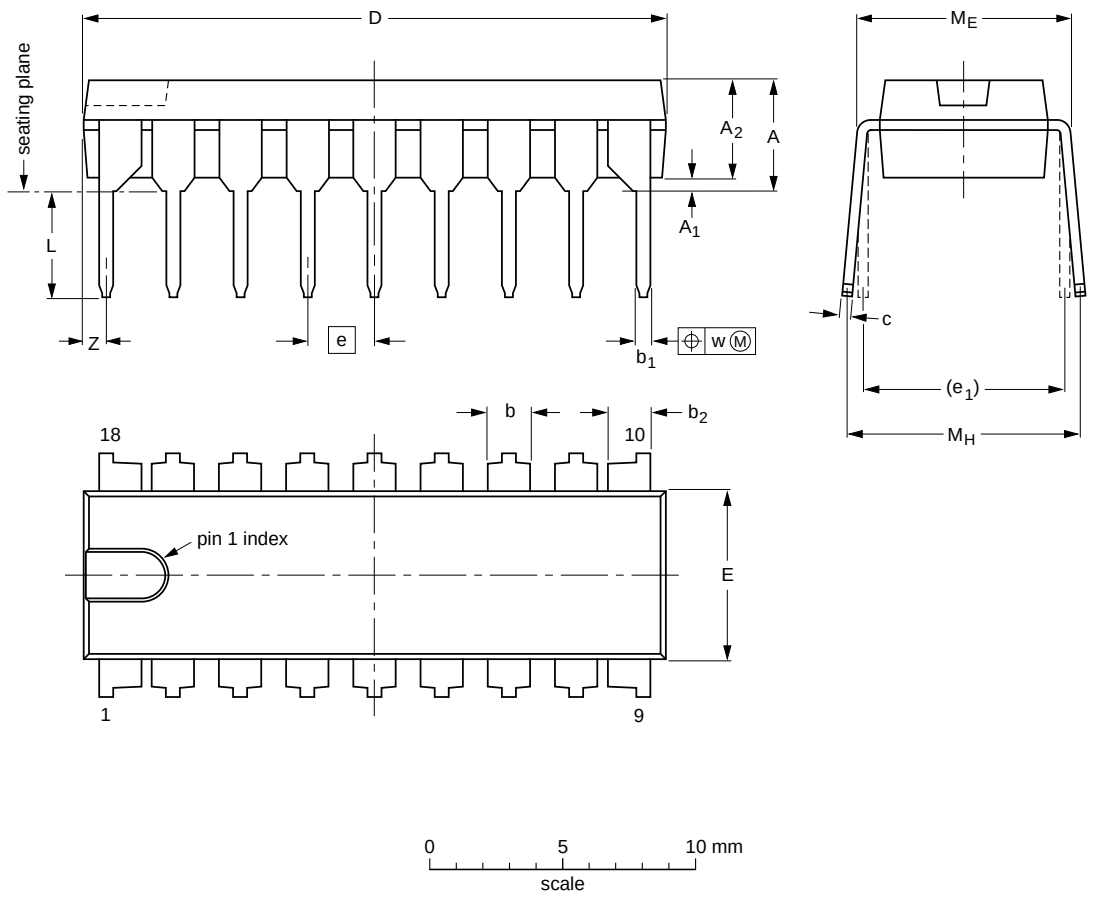


Fig.3 Test and application circuit.

PACKAGE OUTLINE

DIP18: plastic dual in-line package; 18 leads (300 mil) **SOT102-1**



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

UNIT	A max.	A_1 min.	A_2 max.	b	b_1	b_2	c	D (1)	E (1)	e	e_1	L	M_E	M_H	w	Z (1) max.
mm	4.7	0.51	3.7	1.40 1.14	0.53 0.38	1.40 1.14	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	0.85
inches	0.19	0.020	0.15	0.055 0.044	0.021 0.015	0.055 0.044	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	0.033

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			
SOT102-1						~~93-10-14~~ 95-01-23

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

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.