

# TDA2555

# TDA2557

## Dual TV sound demodulator circuits

Philips Semiconductors

Product specification

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.

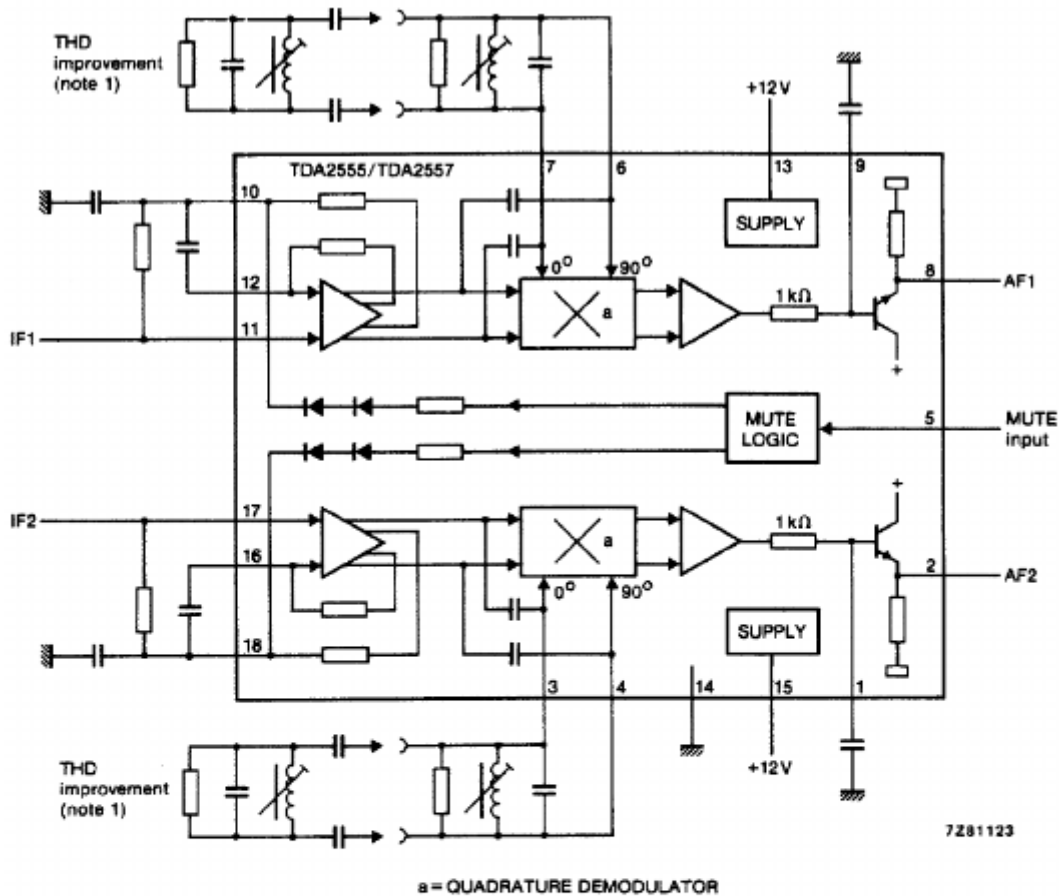


Fig.1 Block diagram.  
TDA2555 with 8-stage limiting amplifier;  
TDA2557 with 5-stage limiting amplifier.

RATINGS

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

- Supply voltage (pins 13 and 15)
- Total power dissipation
- Storage temperature range
- Operating ambient temperature

$V_P$	max. 13,2	V
$P_{tot}$	max. 400	mW
$T_{stg}$	-40 to + 150	°C
$T_{amb}$	0 to + 70	°C

## CHARACTERISTICS

$V_p = V_{13,15-14} = 12 \text{ V}$ ;  $T_{amb} = 25 \text{ }^\circ\text{C}$ ;  $f_{IF1} = 5,5 \text{ MHz}$ ;  $f_{IF2} = 5,74 \text{ MHz}$ ;  $f_{m1} = 1 \text{ kHz}$ ;  $\Delta f = \pm 30 \text{ kHz}$ ;

$V_p = 5 \text{ mV}$  for TDA2555;

$V_i^{(rms)} = 10 \text{ mV}$  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
<b>LIMITING AMPLIFIER</b>					
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	$\mu\text{V}$
TDA2557	$V_{11-12(rms)}$ $V_{16-17(rms)}$	—	250	500	$\mu\text{V}$
<b>DC voltage</b>					
(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
<b>FM DEMODULATOR</b>					
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	$V_{28-44}$	—	$\pm 0,1$	$\pm 0,5$	dB
<b>Total harmonic distortion</b>					
at outputs AF1 and AF2 (note 1)	THD	—	—	0,5	%
<b>A.M. suppression</b>					
at outputs AF1 and AF2, $f_{FM} = 70 \text{ Hz}$ ; $\Delta f = \pm 50 \text{ kHz}$ ; $f_{AM} = 1 \text{ kHz}$ ; $m = 0,3$	AMS	50	—	—	dB
<b>Signal to noise ratio</b>					
at outputs AF1 and AF2 (CCIR weighted, quasi peak)	$(S + N)/N$	65	70	—	dB
<b>Residual IF-signal</b>					
without de-emphasis	$V_{2,8-14(rms)}$	—	30	—	mV
<b>Ripple rejection</b>					
at outputs AF1 and AF2 $f = 50 \text{ Hz to } 20 \text{ kHz}$ ; $V_{if(rms)} = 200 \text{ mV}$	RR	—	40	—	dB

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>AUDIO OUTPUT STAGE</b>					
emitter follower with 1,0 mA bias current					
DC output voltage	$V_{2,8-14}$	3,0	4,0	5,0	V
External DC load resistance	$R_{2,8-14}$	2	—	—	k $\Omega$
AC output current (note 2)	$-I_{2,8-14(p-p)}$	—	—	0,5 mA	
De-emphasis input resistance (note 3)	$R_{1,9-14}$	0,8	1,0	1,2	k $\Omega$
DC voltage (de-emphasis)	$V_{1,9-14}$	3,7	4,7	5,7	V
Crosstalk attenuation					
f = 1 kHz (note 4)	$\alpha_{12,21}$	60	—	—	dB
f = 10 kHz (note 4)	$\alpha_{12,21}$	60	—	—	dB
Output impedance	$R_{2,8-14}$	—	25 —	—	$\Omega$
AF output level (Fig.2, note 5)					
MUTE function					
$V_{i(rms)} < 60$ mV		$\alpha 60$ — —	dB		
Switching input current					
$V_{5-14} = 0$ V		$-I_5$ — —	500 $\mu$ A		
$V_{5-14} = V_p$		$I_5$ — —	500 $\mu$ A		
Internal d.c. voltage					
no mute (pin 5 not connected)	$V_{5-14}$	—	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 k $\Omega$ ) in order to improve the THD performance ( $-I_{2,8} < 4$  mA).
3. The de-emphasis time constant is 50  $\mu$ s.

4. Crosstalk attenuation is defined as:  $\alpha_{12} = \frac{V_{1,4}}{V_{8-14}}$

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.

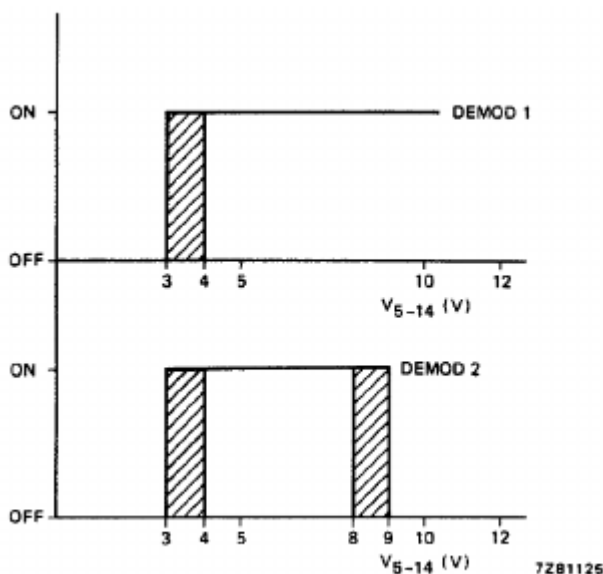


Fig.2 Mute function.

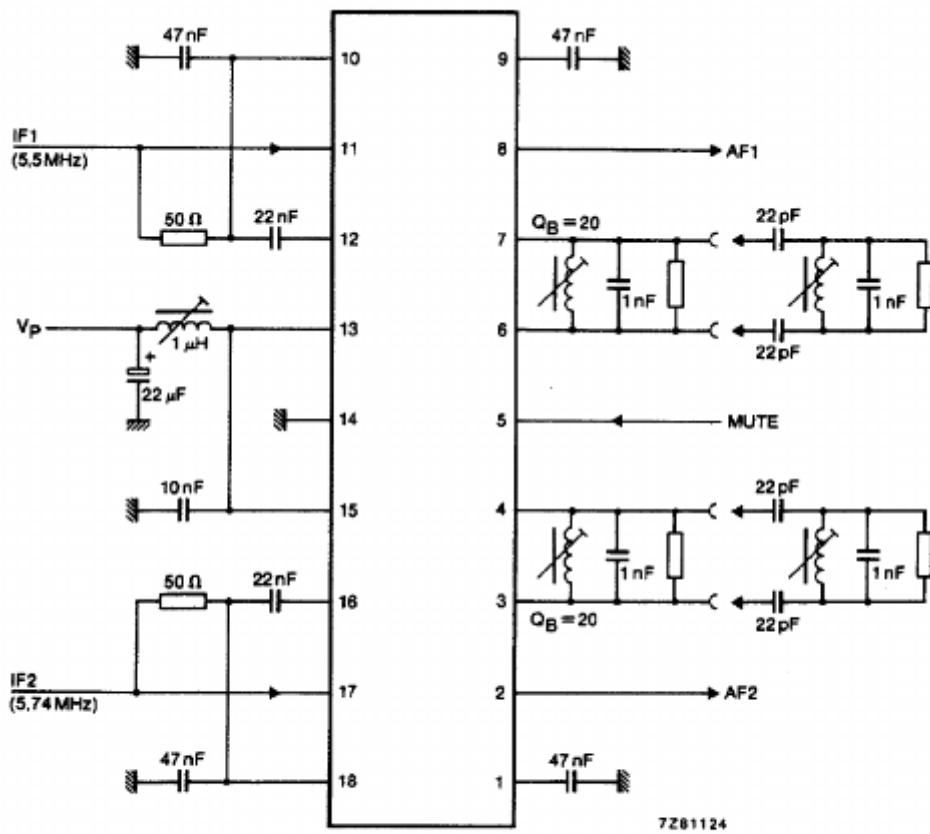
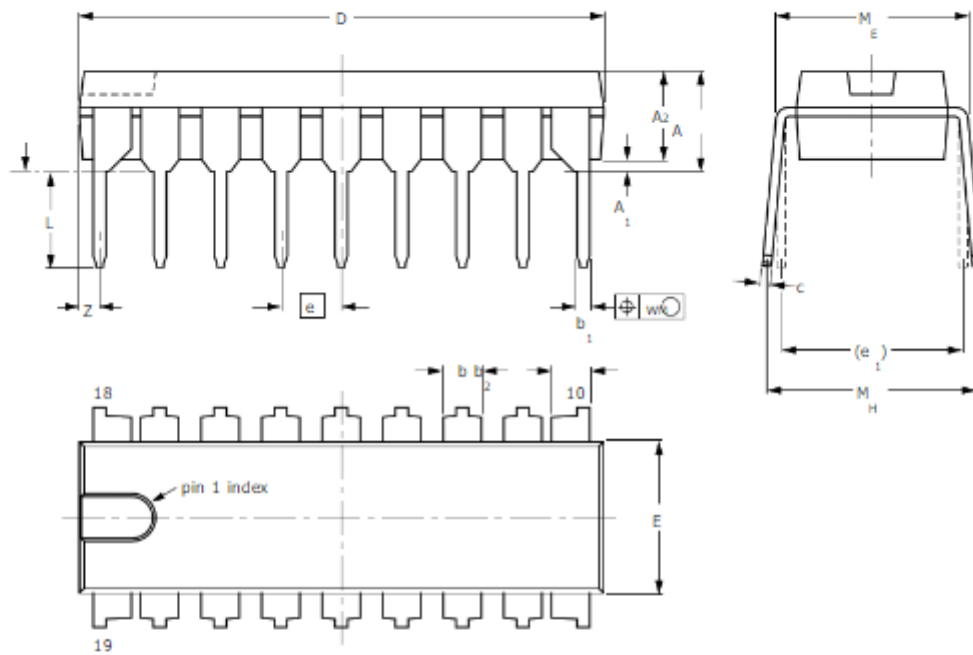


Fig.3 Test and application circuit.

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 min.	A max.	b	b <sub>1</sub>	b <sub>2</sub>	c	D <sup>(1)</sup>	E <sup>(1)</sup>	e	e <sub>1</sub>	L	M <sub>E</sub>	M <sub>H</sub>	w	z <sup>(1)</sup> 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