

# DATA SHEET

## **TDA6800** **TDA6800T** Video modulator circuit

Product specification  
File under Integrated Circuits, IC02

March 1986

## Video modulator circuit

**TDA6800**  
**TDA6800T**

### GENERAL DESCRIPTION

The TDA6800 is a modulator circuit for modulation of video signals on a VHF/UHF carrier. The circuit requires a 5 V power supply and few external components for the negative modulation mode. For positive modulation an external clamp circuit is required. This circuit can be used as a general purpose modulator without additional external components.

### Features

- Balanced modulator
- Symmetrical oscillator
- Video clamp circuit for negative modulation
- Frequency range 50 to 800 MHz

### QUICK REFERENCE DATA

		MIN.	TYP.	MAX.	
Supply voltage range	$V_{5-4}$	4,5	–	5,5	V
Supply current consumption	$I_5$	–	9	–	mA
Video input voltage	$V_{8(p-p)}$	–	1	–	V
Input impedance	$R_8$	30	–	–	k $\Omega$
Output voltage (50 MHz)	$V_{6-7}$	–	13	–	mV
Output voltage (600 MHz)	$V_{6-7}$	–	10	–	mV
Differential gain	$\Delta G$	–	–	10	%
Differential phase	$\Delta\phi$	–	–	10	deg.
Intermodulation distortion	$d_{int}$	–	–80	–	dB

### PACKAGE OUTLINE

TDA6800 : 8-lead dual in-line; plastic (SOT97A); SOT 97-1; 1996 november 29.

TDA6800T: 8-lead mini-pack; plastic (SO8; SOT96A); SOT 96-1; 1996 november 29.

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**RATINGS**

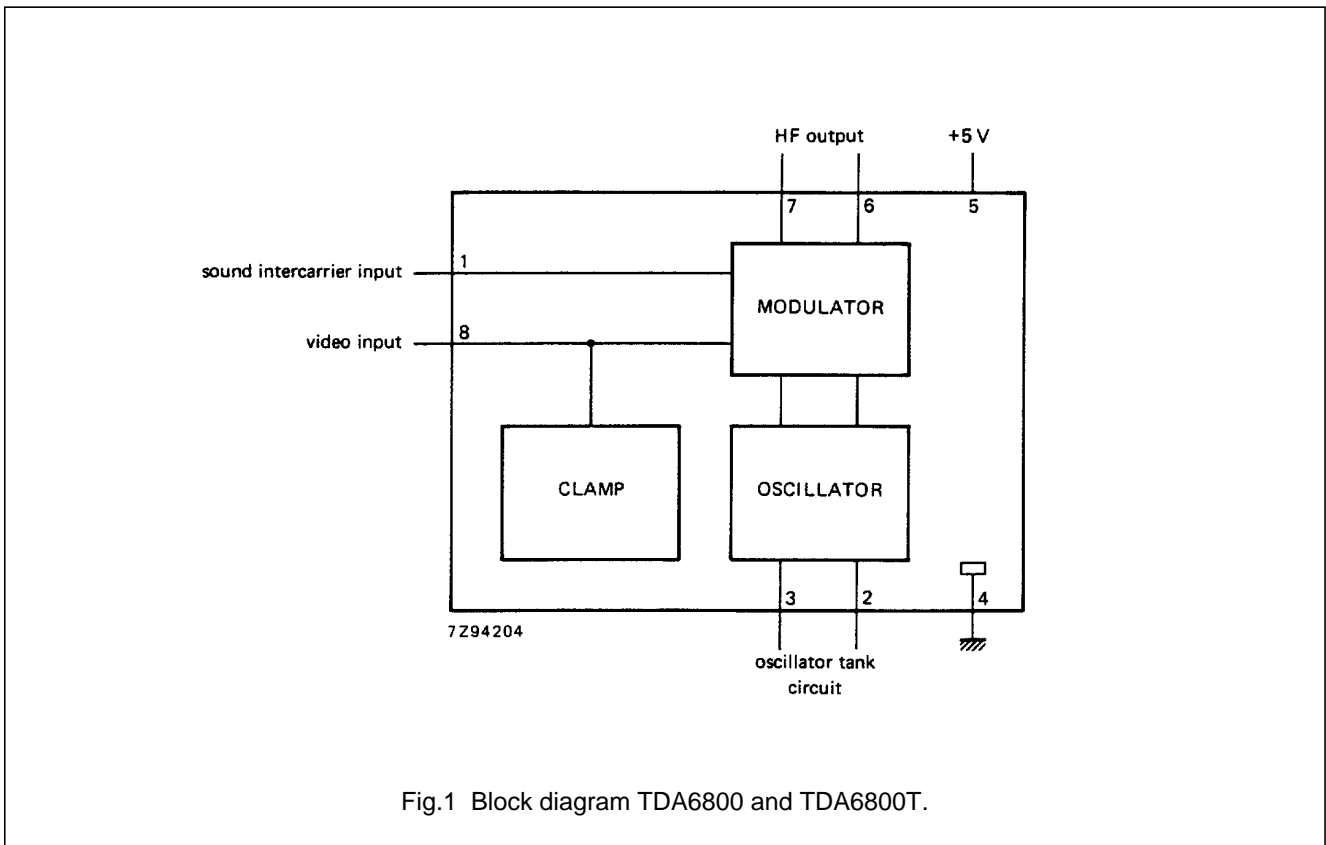
Limiting values in accordance with the Absolute Maximum System (IEC 134)

Supply voltage	$V_{5-4}$	max.	7 V
Input voltage	$V_{8-4}$	max.	4 V
Output voltage	$V_{6, 7-4}$	max.	9 V
Storage temperature	$T_{stg}$	max.	125 °C
Junction temperature	$T_j$	max.	125 °C
Operating ambient temperature range	$T_{amb}$		-25 to + 85 °C

**THERMAL RESISTANCE**

From junction to ambient in free air

TDA6800T	$R_{th j-a}$	260 K/W
TDA6800	$R_{th j-a}$	120 K/W



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TDA6800T**CHARACTERISTICS** $V_P = 5\text{ V}$ ;  $T_{amb} = 25\text{ }^\circ\text{C}$ ; measured in Fig.1; unless otherwise specified

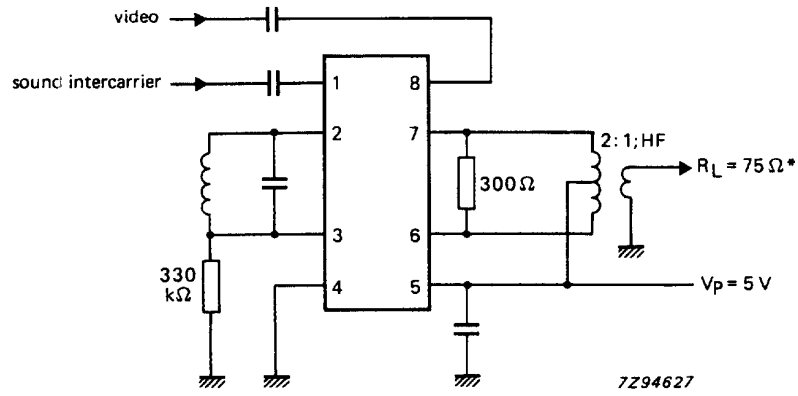
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage range	$V_{5-4}$	4,5	–	5,5	V
Supply current consumption	$I_5$	–	9	13	mA
Video input voltage	$V_{8(p-p)}$	–	1	–	V
Input impedance	$R_8$	30	–	–	k $\Omega$
Voltage (d.c.) at video input (clamp voltage)	$V_8$	–	1,4	–	V
Voltage (d.c.) at sound input	$V_1$	–	2,5	–	V
Output voltage $f = 50\text{ MHz}$ ; $R_L = 75\ \Omega$	$V_{6-7}$	–	13	–	mV
Output voltage $f = 600\text{ MHz}$ ; $R_L = 75\ \Omega$	$V_{6-7}$	–	10	–	mV
Differential gain	$\Delta_G$	–	–	10	%
Differential phase	$\Delta_\phi$	–	–	10	deg.
Intermodulation (1,1 MHz) (note 1)		–	–80	–60	dB
Frequency shift $V_b = 5\%$ , $f = 600\text{ MHz}$	$\Delta_f$	–	–	100	kHz
Frequency shift $V_b = 5\%$ , $f = 800\text{ MHz}$	$\Delta_f$	–	tbf	–	kHz
Frequency drift 25 to 40 $^\circ\text{C}$	$\Delta_f$	–	–	100	kHz
Frequency drift 15 to 55 $^\circ\text{C}$	$\Delta_f$	–	–	300	kHz
<b>Positive modulation</b> (see Fig.3)					
Residual carrier voltage	$V_r$	–	–	2,5	%
Cross modulation (note 2)	$\alpha$	–	0,1	0,25	%

**Notes**

- Input signal: d.c. 0,45 V ( $V_{8-4} = 1,85\text{ V}$ )  
4,4 MHz; input voltage (p-p) = 0,6 V  
5,5 MHz; input voltage (p-p) = 1,26 V  
measured with respect to picture carrier, at  $f = 600\text{ MHz}$ .
- Input signal: d.c. 1 V ( $V_{8-4} = 3,5\text{ V}$ )  
5,5 MHz AM modulated,  $f_m = 100\text{ kHz}$   
 $m = 0,8$ ; input voltage (p-p) = 2,27 V (including modulation)  
measured with respect to the picture carrier, at  $f = 600\text{ MHz}$ .

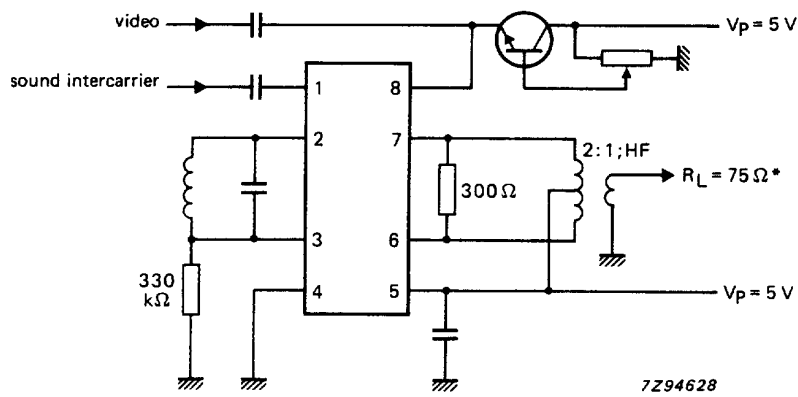
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\* Close to output transformer.

Fig.2 Application for negative modulation.

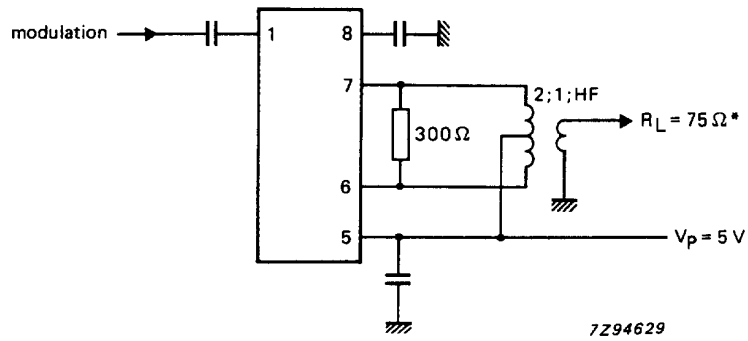


\* Close to output transformer

Fig.3 Application for positive modulation.

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\* Close to output transformer.

Fig.4 Application for general purpose modulation.

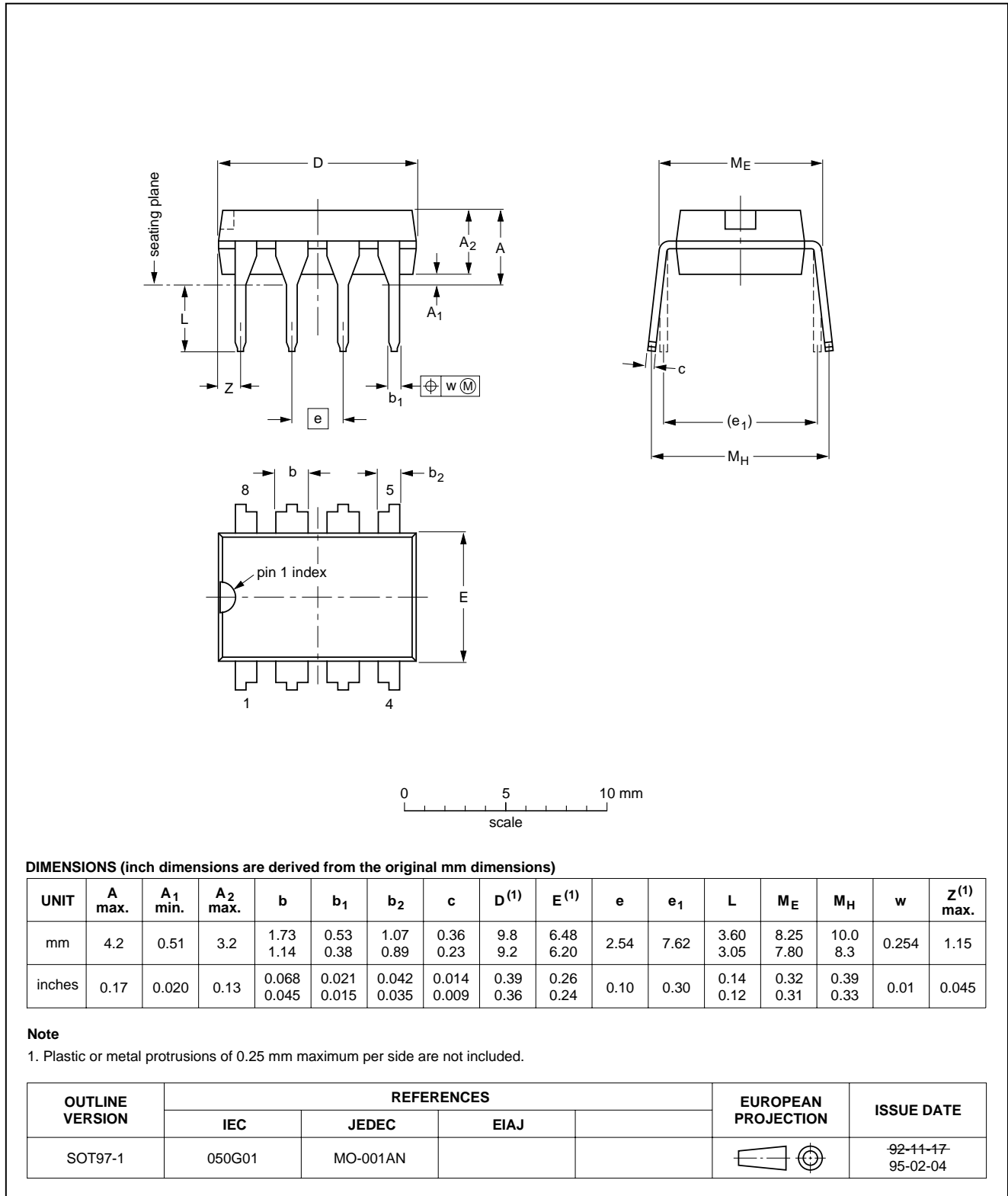
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PACKAGE OUTLINES

DIP8: plastic dual in-line package; 8 leads (300 mil)

SOT97-1

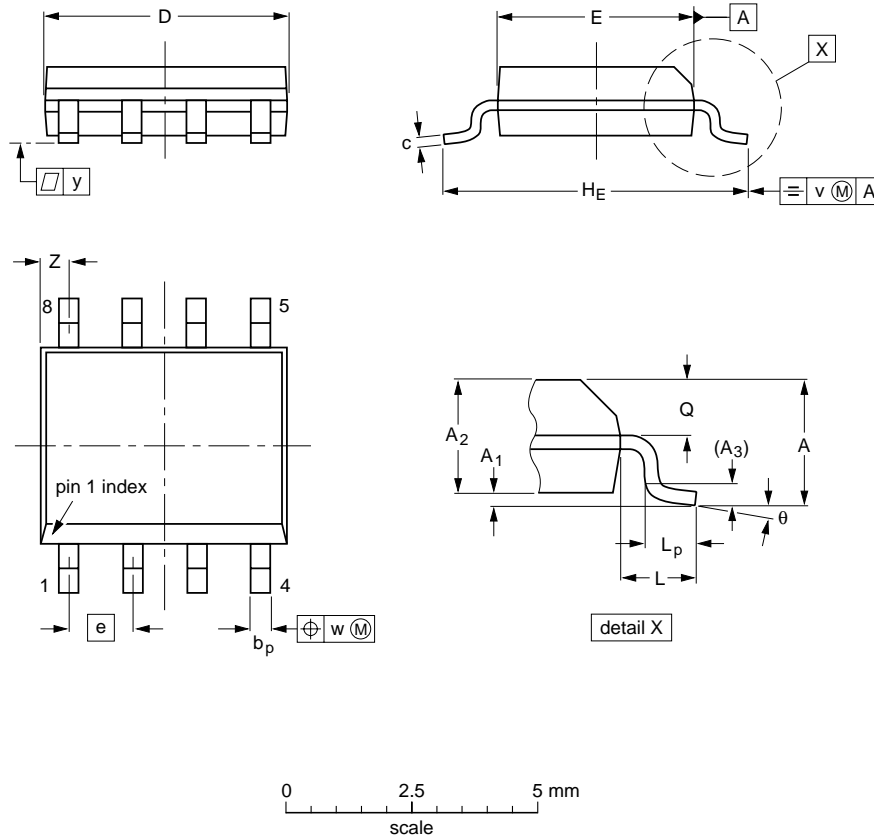


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SO8: plastic small outline package; 8 leads; body width 3.9 mm

SOT96-1



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

UNIT	A <sub>max.</sub>	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	b <sub>p</sub>	c	D <sup>(1)</sup>	E <sup>(2)</sup>	e	H <sub>E</sub>	L	L <sub>p</sub>	Q	v	w	y	z <sup>(1)</sup>	θ
mm	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	5.0 4.8	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8° 0°
inches	0.069	0.010 0.004	0.057 0.049	0.01	0.019 0.014	0.0100 0.0075	0.20 0.19	0.16 0.15	0.050	0.244 0.228	0.041	0.039 0.016	0.028 0.024	0.01	0.01	0.004	0.028 0.012	

Notes

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.
2. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT96-1	076E03S	MS-012AA				95-02-04 97-05-22



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### 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).

#### DIP

##### 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.

#### SO

##### REFLOW SOLDERING

Reflow soldering techniques are suitable for all SO packages.

Reflow soldering requires solder paste (a suspension of fine solder particles, flux and binding agent) to be applied to the printed-circuit board by screen printing, stencilling or pressure-syringe dispensing before package placement.

Several techniques exist for reflowing; for example, thermal conduction by heated belt. Dwell times vary between 50 and 300 seconds depending on heating

method. Typical reflow temperatures range from 215 to 250 °C.

Preheating is necessary to dry the paste and evaporate the binding agent. Preheating duration: 45 minutes at 45 °C.

##### WAVE SOLDERING

Wave soldering techniques can be used for all SO packages if the following conditions are observed:

- A double-wave (a turbulent wave with high upward pressure followed by a smooth laminar wave) soldering technique should be used.
- The longitudinal axis of the package footprint must be parallel to the solder flow.
- The package footprint must incorporate solder thieves at the downstream end.

During placement and before soldering, the package must be fixed with a droplet of adhesive. The adhesive can be applied by screen printing, pin transfer or syringe dispensing. The package can be soldered after the adhesive is cured.

Maximum permissible solder temperature is 260 °C, and maximum duration of package immersion in solder is 10 seconds, if cooled to less than 150 °C within 6 seconds. Typical dwell time is 4 seconds at 250 °C.

A mildly-activated flux will eliminate the need for removal of corrosive residues in most applications.

##### REPAIRING SOLDERED JOINTS

Fix the component by first soldering two diagonally-opposite end leads. Use only a low voltage soldering iron (less than 24 V) applied to the flat part of the lead. Contact time must be limited to 10 seconds at up to 300 °C. When using a dedicated tool, all other leads can be soldered in one operation within 2 to 5 seconds between 270 and 320 °C.

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TDA6800T**DEFINITIONS**

<b>Data sheet status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

**LIFE SUPPORT APPLICATIONS**

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