

DATA SHEET

TDA2555

TDA2557

Dual TV sound demodulator circuits

Product specification
File under Integrated Circuits, IC02

March 1986

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.

Dual TV sound demodulator circuits

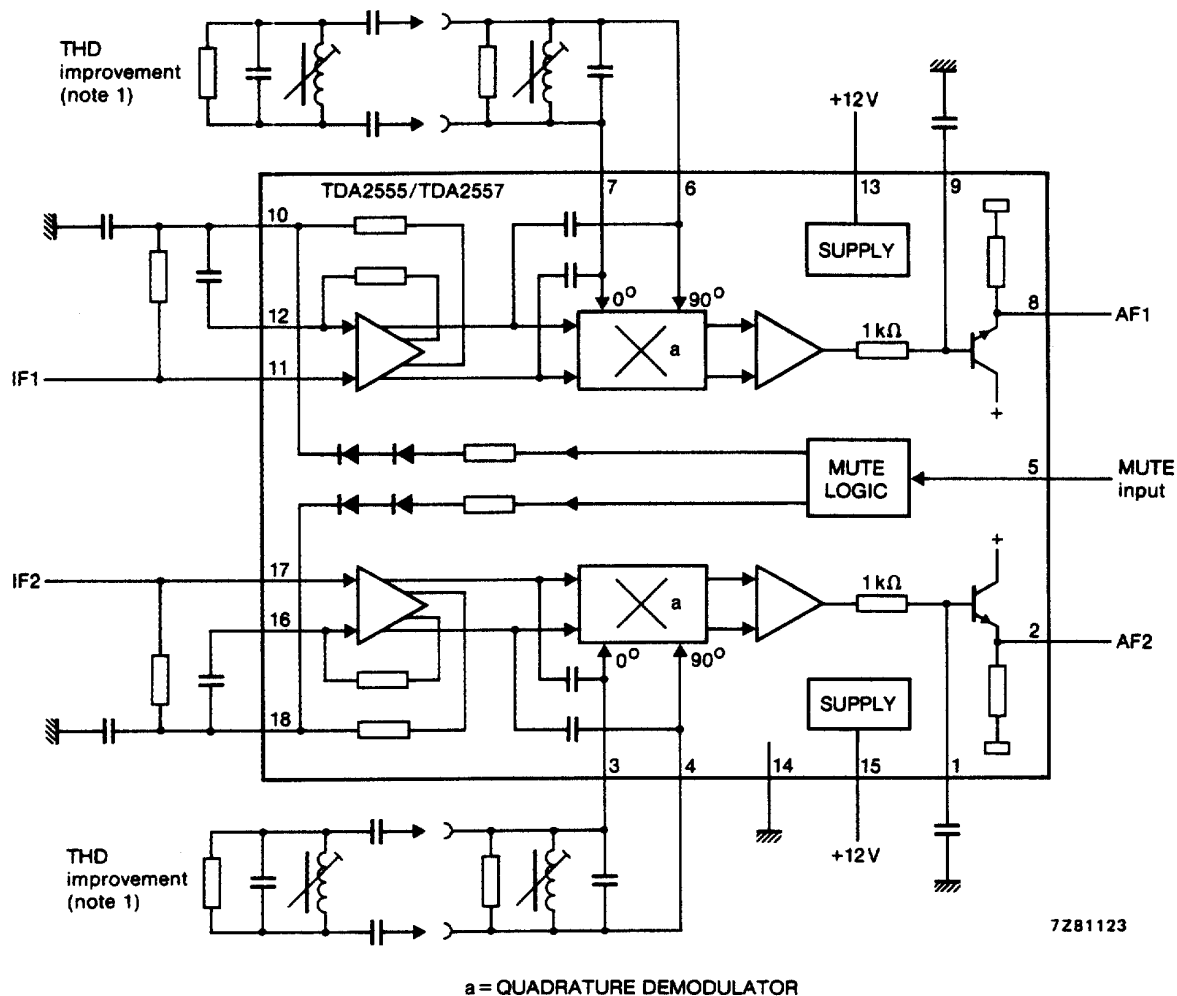
TDA2555
TDA2557

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

Dual TV sound demodulator circuits

TDA2555
TDA2557

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 | |

Dual TV sound demodulator circuits

TDA2555
TDA2557**CHARACTERISTICS**

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

$V_{i(\text{rms})} = 5\text{ mV}$ for TDA2555;

$V_{i(\text{rms})} = 10\text{ mV}$ 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 |
| LIMITING AMPLIFIER | | | | | |
| Maximum input voltage | $V_{11-12(\text{rms})}$ $V_{16-17(\text{rms})}$ | — | 200 | — | mV |
| Input voltage for start of limiting (3 dB AF signal reduction) | | | | | |
| TDA2555 | $V_{11-12(\text{rms})}$ $V_{16-17(\text{rms})}$ | — | 50 | 100 | μV |
| TDA2557 | $V_{11-12(\text{rms})}$ $V_{16-17(\text{rms})}$ | — | 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 | $V_{3-4(\text{rms})}$ $V_{6-7(\text{rms})}$ | — | 200 | — | mV |
| DC voltage | $V_{3,4,6,7-14}$ | — | 3,1 | — | V |
| AF output voltage | $V_{2-14(\text{rms})}$ | 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, $f_{\text{FM}} = 70\text{ Hz}$; $\Delta f = \pm 50\text{ kHz}$; $f_{\text{AM}} = 1\text{ kHz}$; $m = 0,3$ | 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 | $V_{2,8-14(\text{rms})}$ | — | 30 | — | mV |
| Ripple rejection | | | | | |
| at outputs AF1 and AF2 $f = 50\text{ Hz}$ to 20 kHz ; $V_{i(\text{rms})} = 200\text{ mV}$ | RR | — | 40 | — | dB |

Dual TV sound demodulator circuits

TDA2555
TDA2557

| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|--------------------|------|------|------|------------|
| AUDIO OUTPUT STAGE | | | | | |
| 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 Ω |
| 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 Ω |
| 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 |
| Crosstalk attenuation | | | | | |
| f = 10 kHz (note 4) | $\alpha_{12,21}$ | 60 | — | — | dB |
| Output impedance | $R_{2,8-14}$ | — | 25 | — | Ω |
| AF output level (Fig.2, note 5) | | | | | |
| MUTE function | | | | | |
| $V_{i(rms)} < 60$ mV | α | 60 | — | — | dB |
| Switching input current | | | | | |
| $V_{5-14} = 0$ V | $-I_5$ | — | — | 500 | μ A |
| $V_{5-14} = V_P$ | I_5 | — | — | 500 | μ 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 Ω) in order to improve the THD performance ($-I_{2,8} < 4$ mA).
3. The de-emphasis time constant is 50 μ s.
4. Crosstalk attenuation is defined as: $\alpha_{12} = \frac{V_{2-14} \text{ unmodulated}}{V_{8-14}}$ $\alpha_{21} = \frac{V_{8-14} \text{ unmodulated}}{V_{2-14}}$.
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.

Dual TV sound demodulator circuits

TDA2555
TDA2557

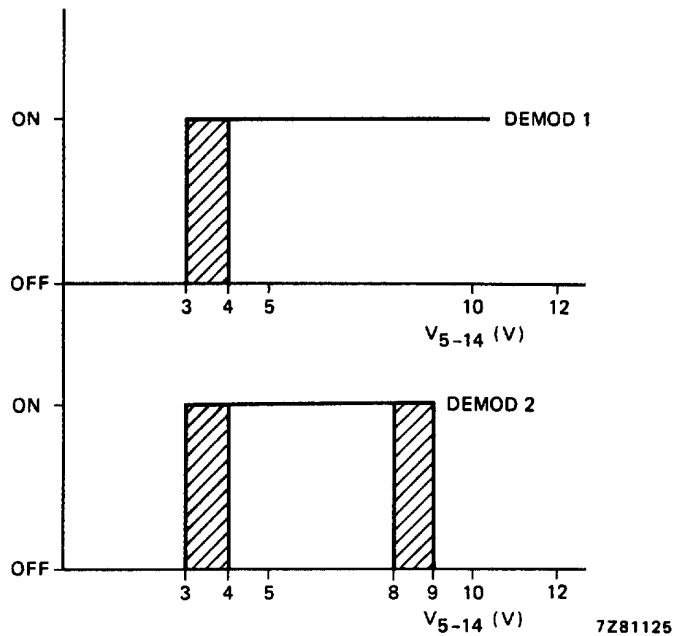


Fig.2 Mute function.

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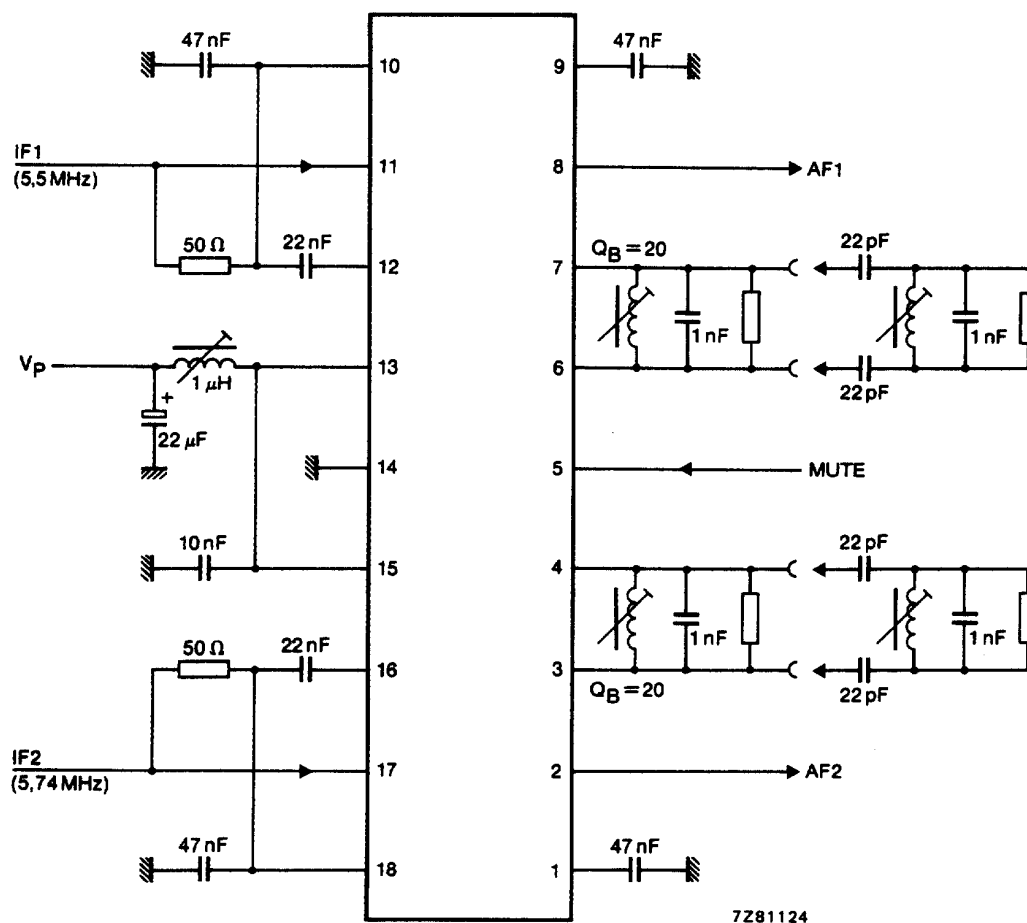
TDA2555
TDA2557

Fig.3 Test and application circuit.

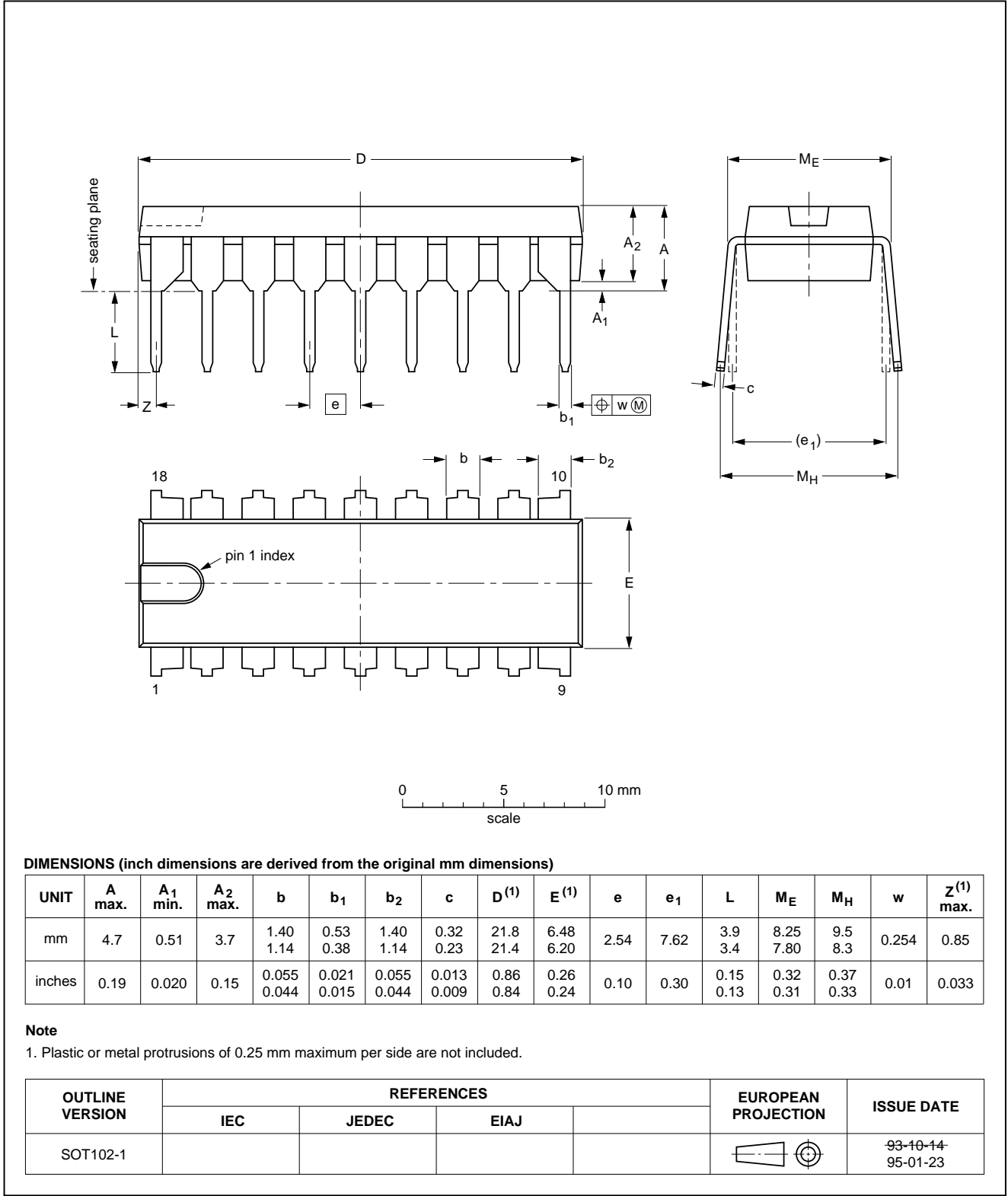
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TDA2555
TDA2557

PACKAGE OUTLINE

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

SOT102-1



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TDA2555
TDA2557**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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