



# TDA7850LV

## 4 x 50 W quad bridge amplifier suitable for low voltage car radio systems

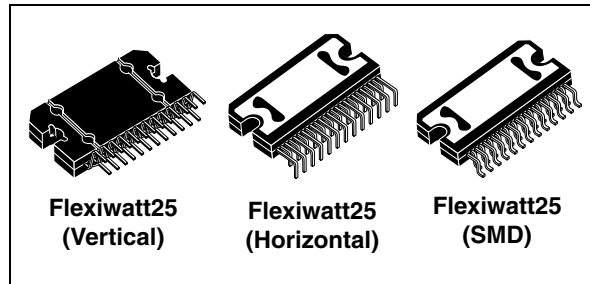
Data brief

### Features

- High output power capability:
  - 4 x 50 W/4  $\Omega$  max.
  - 4 x 30 W/4  $\Omega$  @ 14.4 V, 1 kHz, 10 %
  - 4 x 80 W/2  $\Omega$  max.
  - 4 x 53 W/2  $\Omega$  @ 14.4V, 1 kHz, 10 %
- MOSFET output power stage
- Capable to operate in low voltage conditions (e.g.: “Start - Stop”)
- Excellent 2  $\Omega$  driving capability
- Hi-Fi class distortion
- Low output noise
- Standby function and mute function
- Automute at min. supply voltage detection
- Low external component count:
  - Internally fixed gain (26 dB)
  - No external compensation
  - No bootstrap capacitors
- On board 0.35 A high side driver

### Protections:

- Extreme robustness against any kind of short to GND
- Output short circuit to GND, to  $V_s$ , across the load
- Very inductive loads
- Overrating chip temperature with soft thermal limiter



- Output DC offset detection
- Load dump voltage
- Fortuitous open GND
- Reversed battery
- ESD

### Description

The TDA7850LV is a MOSFET class AB audio power amplifier, designed for high-power car radio. In addition to the outstanding output current capability and distortion performance, the TDA7850LV is extremely robust against several kinds of fortuitous misconnections.

It is, moreover, compliant to the most recent OEM specifications for low voltage operation (the so called 'start-stop' battery profile during engine stop) and features a very compact design in BCD technology.

The TDA7850LV includes offset detector capability (or high side driver output) and is available in both SMD and standard Flexiwatt packages.

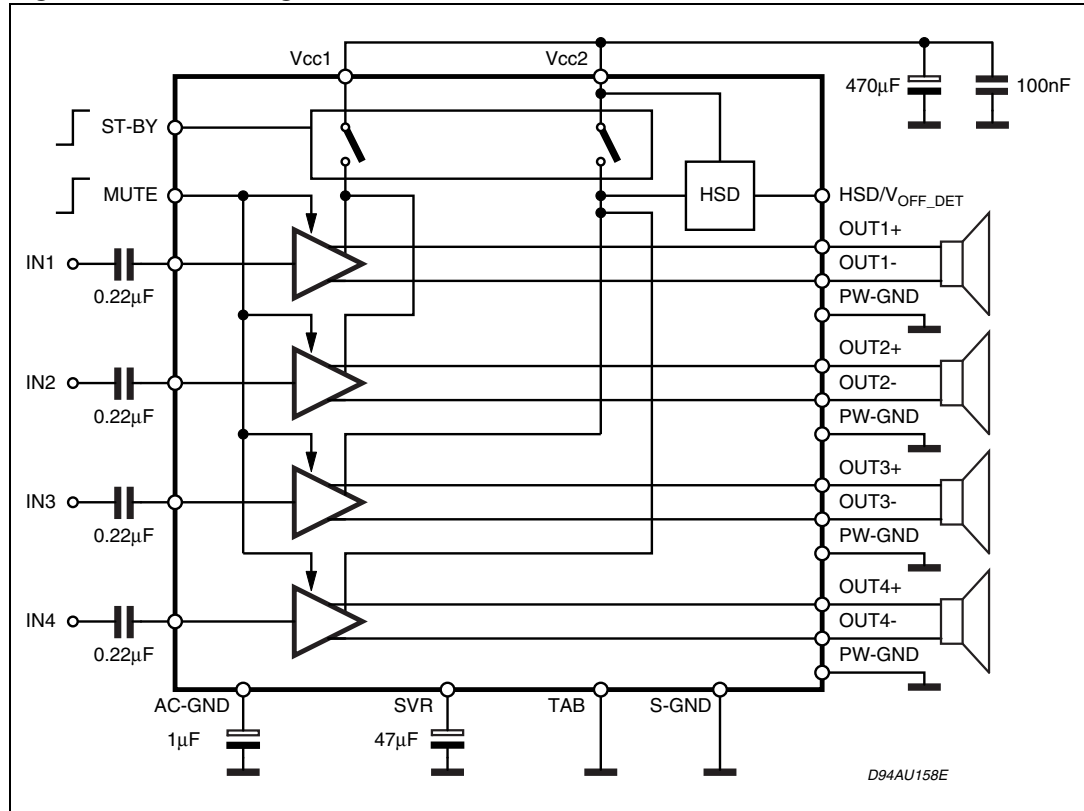
Table 1. Device summary

| Order code    | Package                  | Packing       |
|---------------|--------------------------|---------------|
| TDA7850LV     | Flexiwatt25 (Vertical)   | Tube          |
| TDA7850LVH    | Flexiwatt25 (Horizontal) | Tube          |
| TDA7850LVSM   | Flexiwatt25 (SMD)        | Tube          |
| TDA7850LVSMTR | Flexiwatt25 (SMD)        | Tape and reel |

# 1 Block and pins description diagrams

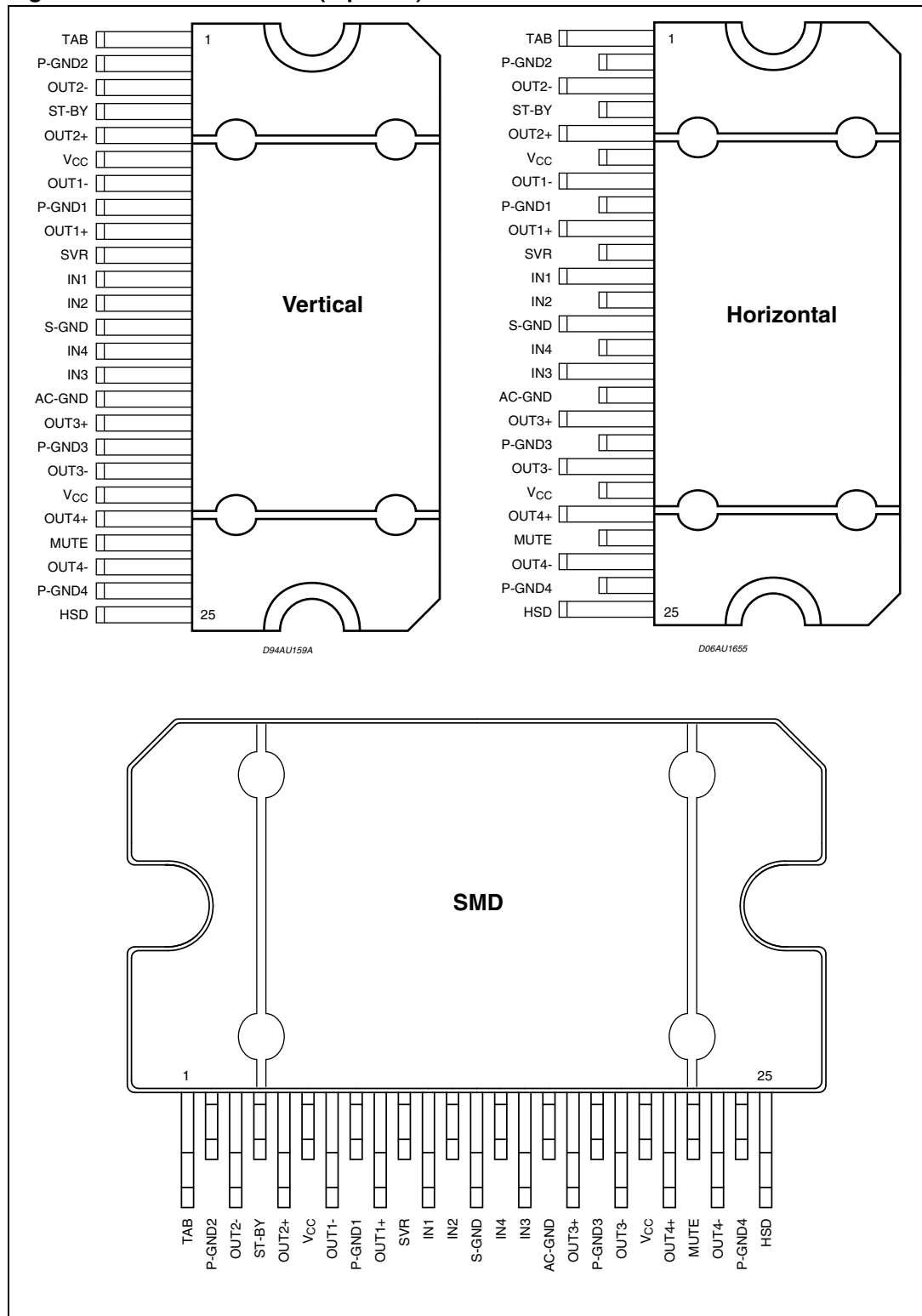
## 1.1 Block diagram

Figure 1. Block diagram



## 1.2 Pins description diagrams

Figure 2. Pins connection (top view)



## 2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com).

ECOPACK® is an ST trademark.

**Figure 3. Flexiwatt25 (vertical) mechanical data and package dimensions**

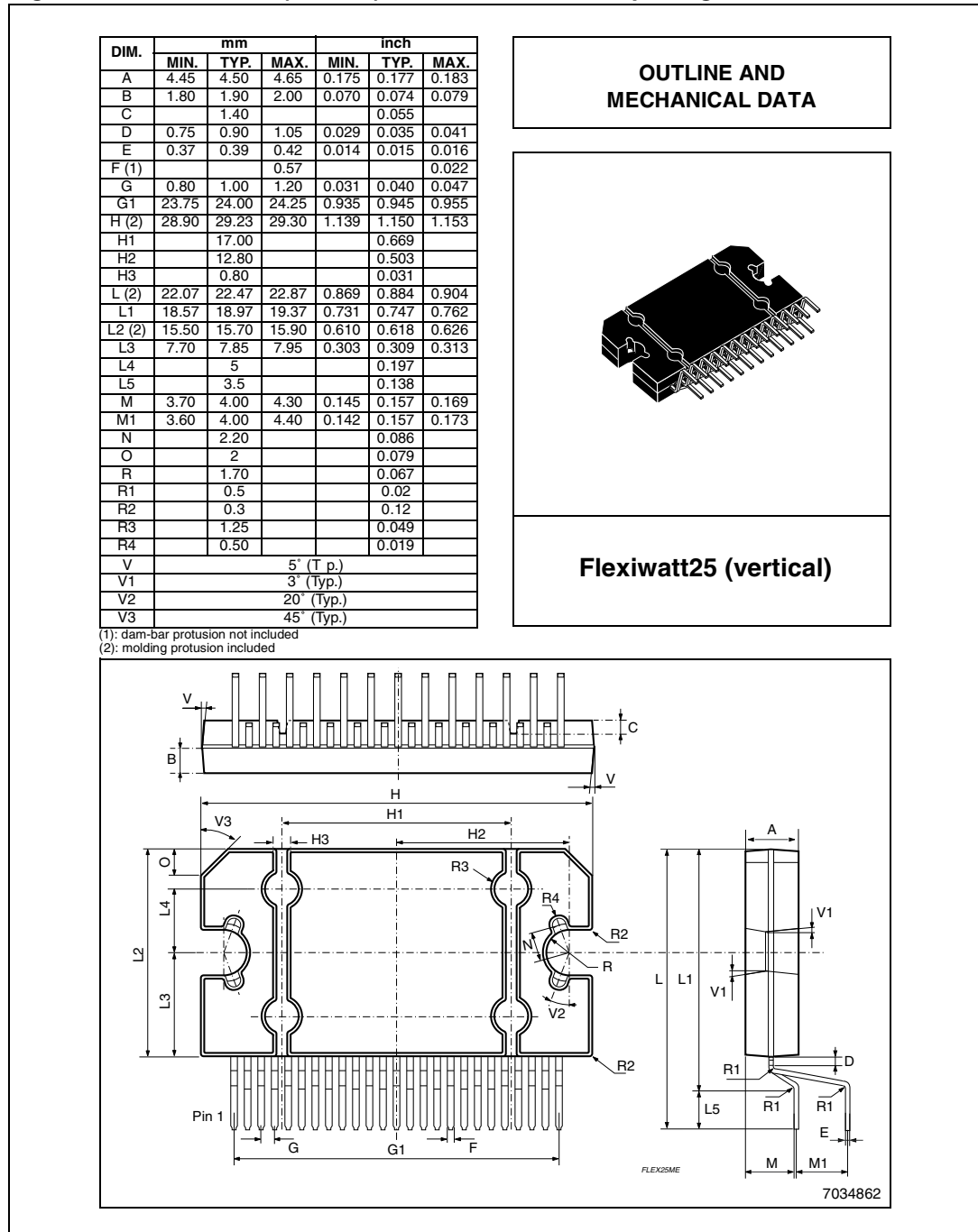
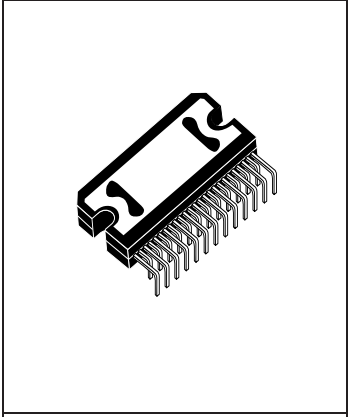


Figure 4. Flexiwatt25 (horizontal) mechanical data and package dimensions

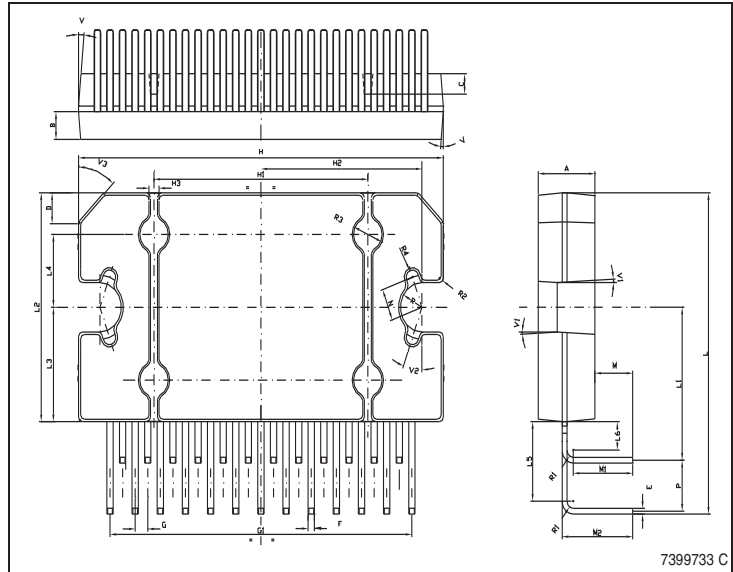
| DIM.   | mm        |       |       | inch  |       |       |
|--------|-----------|-------|-------|-------|-------|-------|
|        | MIN.      | TYP.  | MAX.  | MIN.  | TYP.  | MAX.  |
| A      | 4.45      | 4.50  | 4.65  | 0.175 | 0.177 | 0.183 |
| B      | 1.80      | 1.90  | 2.00  | 0.070 | 0.074 | 0.079 |
| C      |           | 1.40  |       |       | 0.055 |       |
| D      |           | 2.00  |       |       | 0.079 |       |
| E      | 0.37      | 0.39  | 0.42  | 0.014 | 0.015 | 0.016 |
| F (1)  |           |       | 0.57  |       |       | 0.022 |
| G      | 0.75      | 1.00  | 1.25  | 0.029 | 0.040 | 0.049 |
| G1     | 23.70     | 24.00 | 24.30 | 0.933 | 0.945 | 0.957 |
| H (2)  | 28.90     | 29.23 | 29.30 | 1.139 | 1.150 | 1.153 |
| H1     |           | 17.00 |       |       | 0.669 |       |
| H2     |           | 12.80 |       |       | 0.503 |       |
| H3     |           | 0.80  |       |       | 0.031 |       |
| L (2)  | 21.64     | 22.04 | 22.44 | 0.852 | 0.868 | 0.883 |
| L1     | 10.15     | 10.5  | 10.85 | 0.40  | 0.413 | 0.427 |
| L2 (2) | 15.50     | 15.70 | 15.90 | 0.610 | 0.618 | 0.626 |
| L3     | 7.70      | 7.85  | 7.95  | 0.303 | 0.309 | 0.313 |
| L4     |           | 5     |       |       | 0.197 |       |
| L5     | 5.15      | 5.45  | 5.85  | 0.203 | 0.214 | 0.23  |
| L6     | 1.80      | 1.95  | 2.10  | 0.070 | 0.077 | 0.083 |
| M      | 2.75      | 3.00  | 3.50  | 0.108 | 0.118 | 0.138 |
| M1     |           | 4.73  |       |       | 0.186 |       |
| M2     |           | 5.61  |       |       | 0.220 |       |
| N      |           | 2.20  |       |       | 0.086 |       |
| P      | 3.20      | 3.50  | 3.80  | 0.126 | 0.138 | 0.15  |
| R      |           | 1.70  |       |       | 0.067 |       |
| R1     |           | 0.50  |       |       | 0.02  |       |
| R2     |           | 0.30  |       |       | 0.12  |       |
| R3     |           | 1.25  |       |       | 0.049 |       |
| R4     |           | 0.50  |       |       | 0.02  |       |
| V      | 5 (Typ.)  |       |       |       |       |       |
| V1     | 3 (Typ.)  |       |       |       |       |       |
| V2     | 20 (Typ.) |       |       |       |       |       |
| V3     | 45 (Typ.) |       |       |       |       |       |

OUTLINE AND MECHANICAL DATA



Flexiwatt25 (Horizontal)

(1): dam-bar protusion not included; (2): molding protusion included

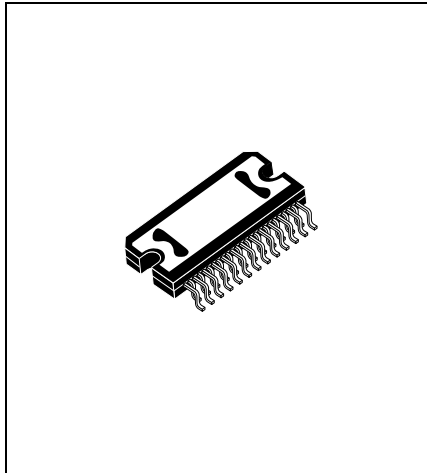


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Figure 5. Flexiwatt25 (SMD) mechanical data and package dimensions

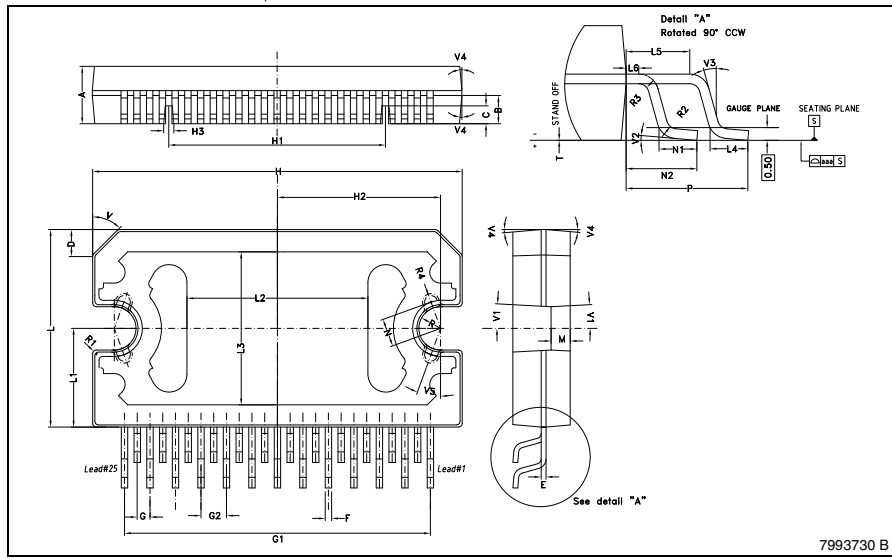
| DIM.   | mm    |       |       | inch    |        |        |
|--------|-------|-------|-------|---------|--------|--------|
|        | MIN.  | TYP.  | MAX.  | MIN.    | TYP.   | MAX.   |
| A      | 4.45  | 4.50  | 4.65  | 0.1752  | 0.1772 | 0.1831 |
| B      | 2.12  | 2.22  | 2.32  | 0.0835  | 0.0874 | 0.0913 |
| C      |       | 1.40  |       |         | 0.0551 |        |
| D      |       | 2.00  |       |         | 0.0787 |        |
| E      | 0.36  | 0.40  | 0.44  | 0.0142  | 0.0157 | 0.0173 |
| F**    | 0.47  | 0.51  | 0.57  | 0.0185  | 0.0201 | 0.0224 |
| G(*)   | 0.75  | 1.00  | 1.25  | 0.0295  | 0.0394 | 0.0492 |
| G1     | 23.70 | 24.00 | 24.30 | 0.9331  | 0.9449 | 0.9567 |
| G2(*)  | 1.75  | 2.00  | 2.25  | 0.0689  | 0.0787 | 0.0886 |
| H(**)  | 28.85 | 29.23 | 29.40 | 1.1358  | 1.1508 | 1.1575 |
| H1     |       | 17.00 |       |         | 0.6693 |        |
| H2     |       | 12.80 |       |         | 0.5039 |        |
| H3     |       | 0.80  |       |         | 0.0315 |        |
| L(**)  | 15.50 | 15.70 | 15.90 | 0.6102  | 0.6181 | 0.6260 |
| L1     | 7.70  | 7.85  | 7.95  | 0.3031  | 0.3091 | 0.3130 |
| L2     | 14.00 | 14.20 | 14.40 | 0.5512  | 0.5591 | 0.5669 |
| L3     | 11.80 | 12.00 | 12.20 | 0.4646  | 0.4724 | 0.4803 |
| L4     | 1.30  | 1.48  | 1.66  | 0.0512  | 0.0583 | 0.0654 |
| L5     | 2.42  | 2.50  | 2.58  | 0.0953  | 0.0984 | 0.1016 |
| L6     | 0.42  | 0.50  | 0.58  | 0.0165  | 0.0197 | 0.0228 |
| M      |       | 1.50  |       |         | 0.0591 |        |
| N      |       | 2.20  |       |         | 0.0866 |        |
| N1     | 1.30  | 1.48  | 1.66  | 0.0512  | 0.0583 | 0.0654 |
| N2(*)  | 2.73  | 2.83  | 2.93  | 0.1075  | 0.1114 | 0.1154 |
| P(*)   | 4.73  | 4.83  | 4.93  | 0.1862  | 0.1902 | 0.1941 |
| R      |       | 1.70  |       |         | 0.0669 |        |
| R1     |       | 0.30  |       |         | 0.0118 |        |
| R2     | 0.35  | 0.40  | 0.45  | 0.0138  | 0.0157 | 0.0177 |
| R3     | 0.35  | 0.40  | 0.45  | 0.0138  | 0.0157 | 0.0177 |
| R4     |       | 0.50  |       |         | 0.0197 |        |
| T(*)   | -0.08 |       | 0.10  | -0.0031 |        | 0.0039 |
| aaa(*) |       | 0.1   |       |         | 0.0039 |        |
| V      |       | 45°   |       |         | 45°    |        |
| V1     |       | 3°    |       |         | 3°     |        |
| V2     | 3°    | 5°    | 7°    | 3°      | 5°     | 7°     |
| V3     | 12°   | 15°   | 18°   | 12°     | 15°    | 18°    |
| V4     |       | 5°    |       |         | 5°     |        |
| V5     |       | 20°   |       |         | 20°    |        |

OUTLINE AND MECHANICAL DATA



Flexiwatt25 (SMD)

(\*) Golden parameters  
 (\*\*) - Dimension "F" doesn't include dam-bar protrusion.  
 - Dimensions "H" and "L" include mold flash or protrusions.



### 3 Revision history

**Table 2. Document revision history**

| Date        | Revision | Changes  |
|-------------|----------|--|
| 09-Jul-2010 | 1        | Initial release.   |
| 04-Aug-2010 | 2        | Added <a href="#">Section 1: Block and pins description diagrams</a> . |
| 22-Oct-2010 | 3        | Minor text changes.  |
| 18-Sep-2013 | 4        | Updated Disclaimer.  |

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