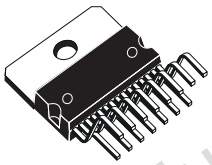
# L4943

## MULTIFUNCTION VOLTAGE REGULATOR FOR CAR RADIO

- 3 PROGRAMMABLE OUTPUTS:
  - 3 TO 11V (500mA);
  - 3 TO 11V (500mA);
  - 3 TO 7V (500mA) STANDBY
- OUT1 AND OUT2 WITH INDEPENDENT ENABLE CONTROL FOR STAND-BY MODE
- 0.4A HIGH SIDE DRIVER
- LOAD DUMP PROTECTION
- THERMAL SHUTDOWN



**Multiwatt 15**

**ORDERING NUMBER:** L4943

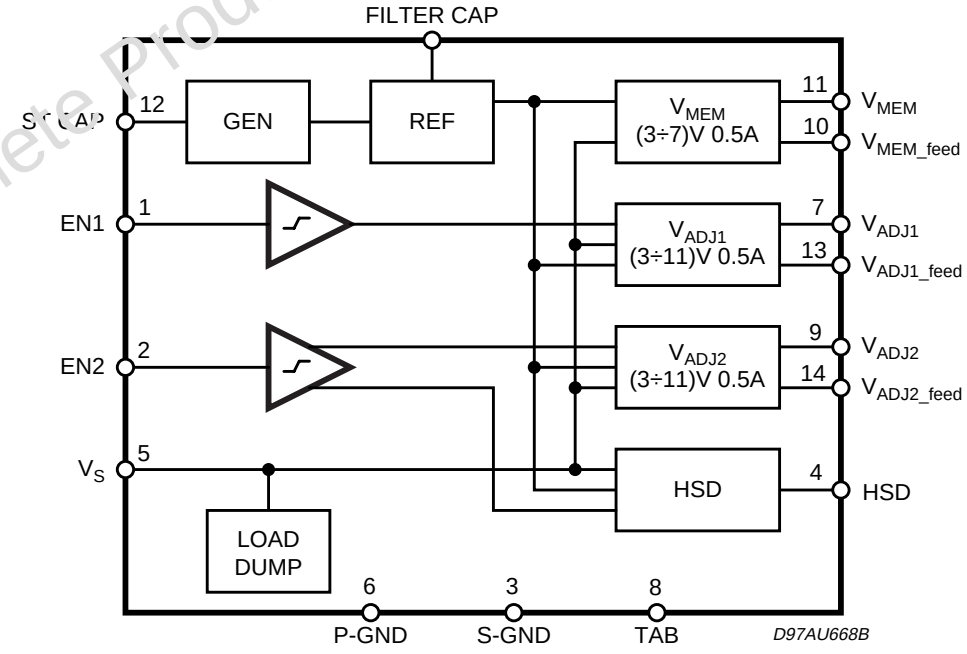
### DESCRIPTION

The L4943 contains a triple voltage regulator and a high side driver.

In stand-by the output is active as long as possible even when in thermal shutdown or under any other fault conditions.

The STCAP pin allows the use of a reserve supply capacitor that will hold enough energy for the 5V Stand-by line to allow the µP to store data.

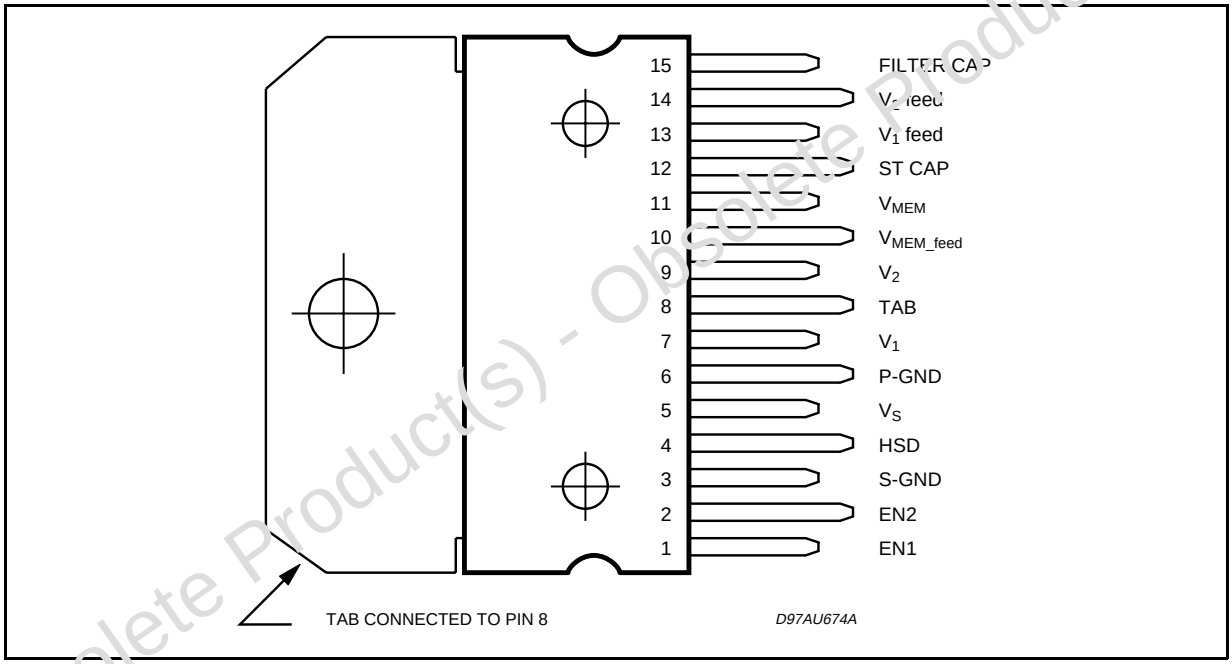
### BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_S$ | DC Operating Supply Voltage | -0.6 to 30 | V |
| | Transient Supply Overvoltage (50ms) | 50 | V |
| $I_O$ | Voltage Regulator Output Current | Internally limited | |
| $V_{in}$ | Input Voltage (EN1, EN2) | 0 to 6 | V |
| RESR | Output Capacitor Series Eq. Resistance | 0.2 to 10 | Ω |
| $P_{tot}$ | Power Dissipation ($T_{case}$ = 85°C) | 33 | W |
| $T_{op}$ | Operating Temperature Range | -40 to 85 | °C |
| $T_{stg}$ | Storage Temperature Ranges | -55 to 150 | °C |

## PIN CONNECTION (t.b.d.)



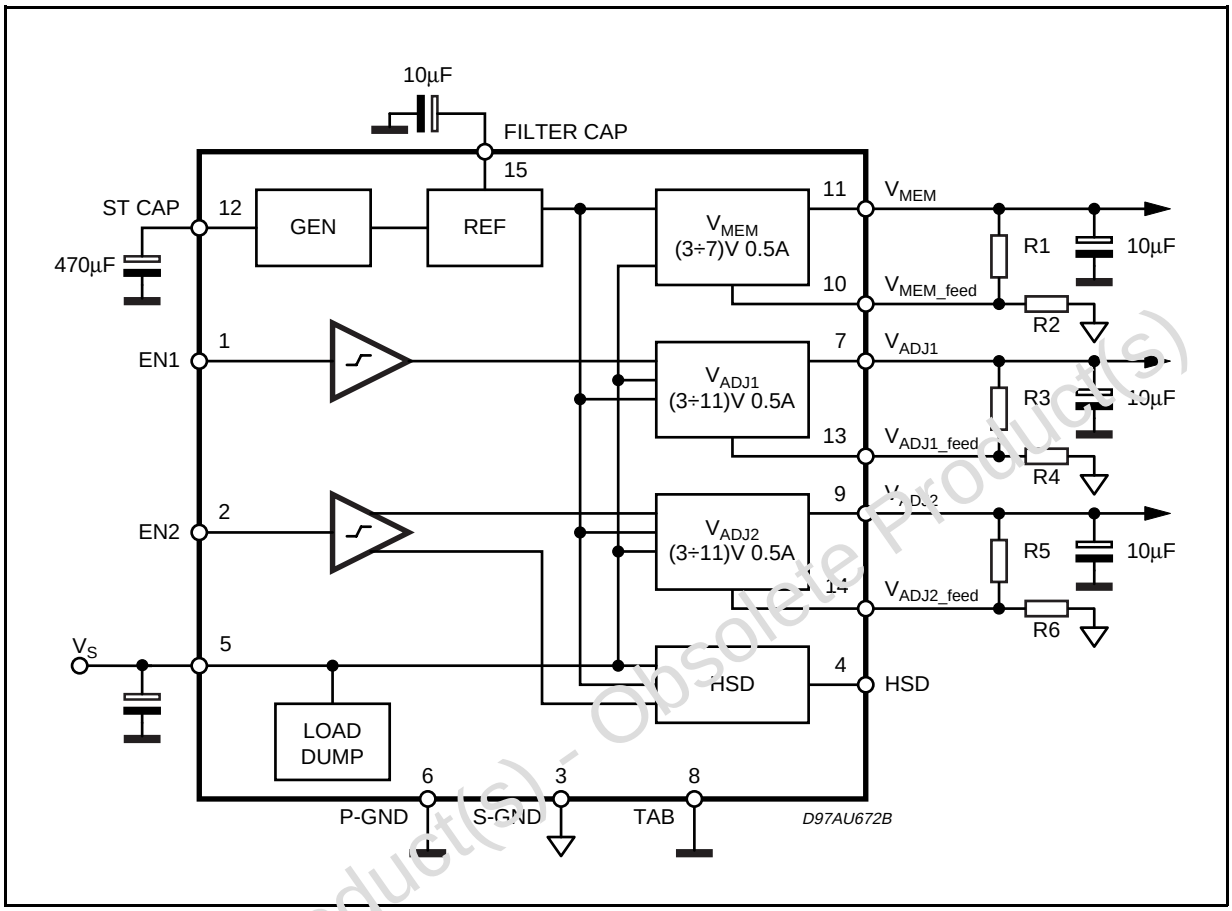

## THERMAL DATA

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{Th\ j\text{-}case}$ | Thermal Resistance Junction to Case | 2 | °C/W |

**ELECTRICAL CHARACTERISTICS** (Referred to Test & Application Circuit; $V_S$ = 14.4V; $T_{amb}$ = 25°C; unless otherwise specified).

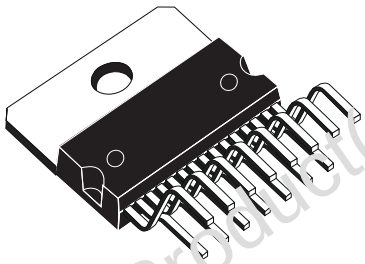
| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **5V STAND-BY** | | | | | | |
| $V_{out\ Mem}$ | Output Voltage | no load; 1+R1/R2 = 2.4<br>no load; 1+R1/R2 = 4<br>no load; 1+R1/R2 = 5.6 | 2.85<br>4.75<br>6.65 | 3<br>5<br>7 | 3.15<br>5.25<br>7.35 | V<br>V<br>V |
| $\Delta V_{line}$ | Line Regulation | no load; 11<Vs<18V | | 5 | 50 | mV |
| $\Delta V_{load}$ | Load Regulation | 5mA < $I_O$ < 500mA | | 8 | 80 | mV |
| $V_{dropout}$ | Dropout Voltage | $I_O$ = 200mA, $V_O$ = 5V<br>$I_O$ = 500mA, $V_O$ = 5V | | 0.36<br>0.9 | 0.5<br>1.25 | V<br>V |
| $I_{lim}$ | Current Limit | Out short to GND | 550 | 800 | 1000 | mA |
| $I_{qst\text{-}by}$ | Quiescent Current | $I_O$ = 100µA; EN1 = EN2 =0<br>$I_O$ = 500mA; EN1 = EN2 = 5V | | 0.35<br>10 | 0.5<br>25 | mA<br>mA |
| **ADJUSTABLE REG1 SWITCHED** | | | | | | |
| $V_{outadj}$ | Output Voltage | no load; 1+R3/R4 = 2.4<br>no load; 1+R3/R4 = 4<br>no load; 1+R3/R4 = 8.8 | 2.85<br>4.75<br>10.45 | 3<br>5<br>11 | 3.15<br>5.25<br>11.55 | V<br>V<br>V |
| $\Delta V_{line}$ | Line Regulation | no load | | 0.7 | 7 | mV/V |
| $\Delta V_{load}$ | Load Regulation | 5mA < $I_O$ < 500mA | | 8 | 80 | mV |
| $V_{dropout}$ | Dropout Voltage | $I_O$ = 200mA, $V_O$ = 5V<br>$I_O$ = 500mA, $V_O$ = 5V<br>$I_O$ = 200mA, $V_O$ = 11V<br>$I_O$ = 500mA, $V_O$ = 11V | | 0.45<br>1.1<br>0.4<br>1 | 0.6<br>1.5<br>0.55<br>1.4 | V<br>V<br>V<br>V |
| $I_{lim}$ | Current Limit | Out short to GND | 550 | 800 | 1000 | mA |
| $I_{q2}$ | Quiescent Current | $I_O$ = 500mA | | 10 | 25 | mA |
| SVR | Supply Voltage Rejection | f = 0.1 to 10kHz, $V_O$ = 5V | 45 | 55 | | dB |
| EN1 on | EN ADJ1 ON | | 2 | | | V |
| EN1 off | EN ADJ1 OFF | | | | 1 | V |
| **ADJUSTABLE REG2 SWITCHED** | | | | | | |
| $V_{outadj}$ | Output Voltage | no load; 1+R3/R4 = 2.4<br>no load; 1+R5/R6 = 4<br>no load; 1+R3/R4 = 8.8 | 2.85<br>4.75<br>10.45 | 3<br>5<br>11 | 3.15<br>5.25<br>11.55 | V<br>V<br>V |
| $\Delta V_{line}$ | Line Regulation | no load | | 0.7 | 7 | mV/V |
| $\Delta V_{load}$ | Load Regulation | 5mA < $I_O$ < 500mA | | 12 | 80 | mV |
| $V_{dropout}$ | Dropout Voltage | $I_O$ = 200mA, $V_O$ = 5V<br>$I_O$ = 500mA, $V_O$ = 5V<br>$I_O$ = 200mA, $V_O$ = 11V<br>$I_O$ = 500mA, $V_O$ = 11V | | 0.45<br>1.1<br>0.4<br>1 | 0.6<br>1.5<br>0.55<br>1.4 | V<br>V<br>V<br>V |
| $I_{lim}$ | Current Limit | Out short to GND | 550 | 800 | 1100 | mA |
| $I_{q3}$ | Quiescent Current | $I_O$ = 500mA | | 10 | 25 | mA |
| SVR | Supply Voltage Rejection | f = 0.1 to 10kHz, $V_O$ = 5V | 45 | 55 | | dB |
| EN2H on2 | EN ADJ2 ON | | 1.3 | | | V |
| EN2H off2 | EN ADJ2 OFF | | | | 0.5 | V |
| **400mA HSD SWITCHED** | | | | | | |
| $V_{dropout}$ | Dropout Voltage | $I_O$ = 400mA, 9V < $V_S$ < 16V | | 0.2 | 0.6 | V |
| $I_{lim}$ | Current Limit | | 0.45 | 0.65 | 0.8 | A |
| $I_{qhsd}$ | Quiescent Current | $I_O$ = 400mA | | 10 | 25 | mA |
| EN2 on H | EN HSD ON | | 2.5 | | | V |
| EN2 off H | EN HSD OFF | | | | 1.7 | V |
| EN2 Gap | EN HSD ON minus EN ADJ2 ON | | | 1 | | V |

**Figure 1. Application circuit.**

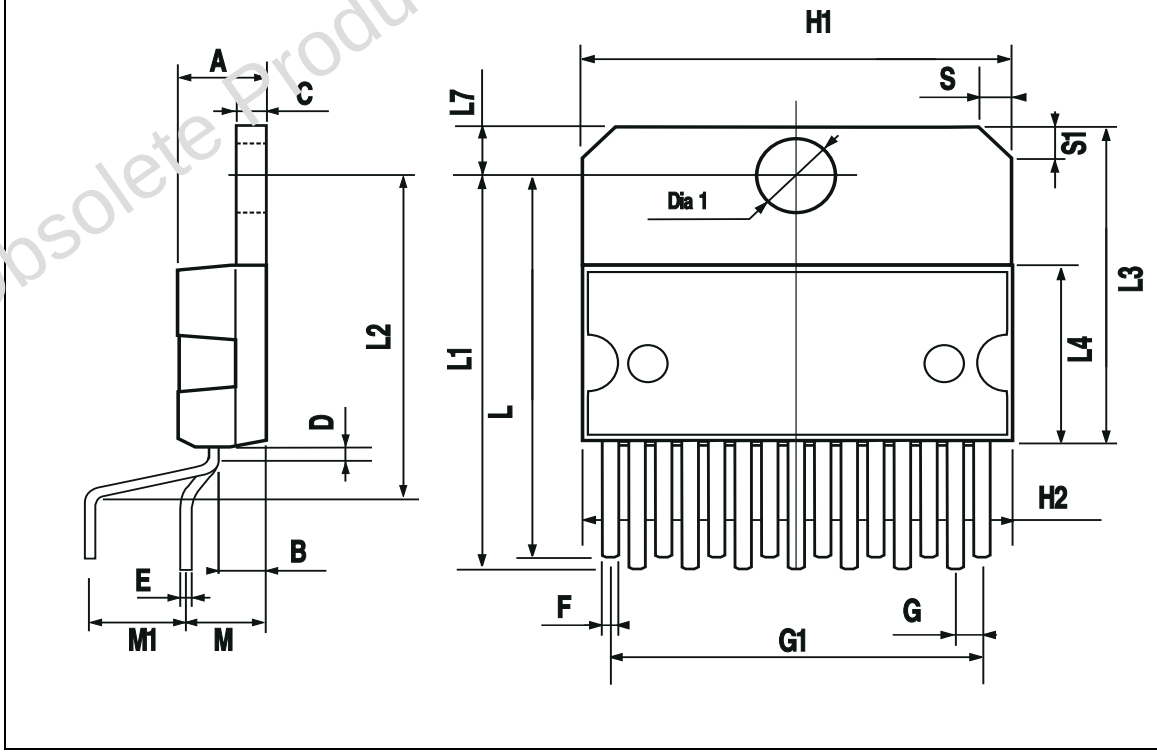


| DIM. | mm | | | inch | | |
|---|---|---|---|---|---|---|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | | | 5 | | | 0.197 |
| B | | | 2.65 | | | 0.104 |
| C | | | 1.6 | | | 0.063 |
| D | | 1 | | | 0.039 | |
| E | 0.49 | | 0.55 | 0.019 | | 0.022 |
| F | 0.66 | | 0.75 | 0.026 | | 0.030 |
| G | 1.02 | 1.27 | 1.52 | 0.040 | 0.050 | 0.060 |
| G1 | 17.53 | 17.78 | 18.03 | 0.690 | 0.700 | 0.710 |
| H1 | 19.6 | | | 0.772 | | |
| H2 | | | 20.2 | | | 0.795 |
| L | 21.9 | 22.2 | 22.5 | 0.862 | 0.874 | 0.886 |
| L1 | 21.7 | 22.1 | 22.5 | 0.854 | 0.870 | 0.886 |
| L2 | 17.65 | | 18.1 | 0.695 | | 0.713 |
| L3 | 17.25 | 17.5 | 17.75 | 0.679 | 0.689 | 0.699 |
| L4 | 10.3 | 10.7 | 10.9 | 0.406 | 0.421 | 0.429 |
| L7 | 2.65 | | 2.9 | 0.104 | | 0.114 |
| M | 4.25 | 4.55 | 4.85 | 0.167 | 0.179 | 0.191 |
| M1 | 4.63 | 5.08 | 5.53 | 0.182 | 0.200 | 0.218 |
| S | 1.9 | | 2.6 | 0.075 | | 0.102 |
| S1 | 1.9 | | 2.6 | 0.075 | | 0.102 |
| Dia1 | 3.65 | | 3.85 | 0.144 | | 0.152 |

## OUTLINE AND MECHANICAL DATA



**Multiwatt15 V**



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