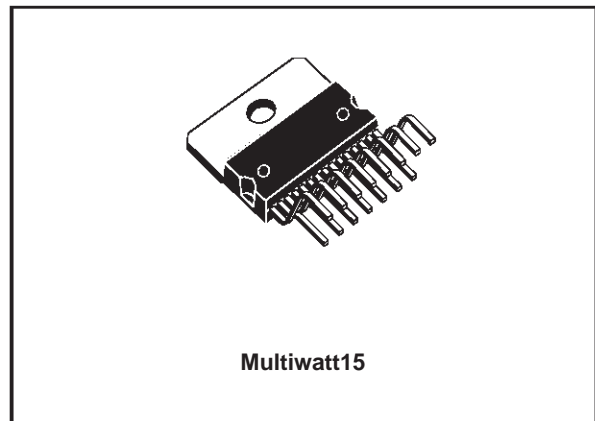


MULTIFUNCTION VOLTAGE REGULATOR FOR CAR RADIO

PRELIMINARY DATA

- 3 OUTPUTS:
9.2V (500mA);
5V (1A);
5V (100mA) STANDBY
- OUT1 (9.2V) AND OUT2 (5V) WITH INDEPENDENT ENABLE CONTROL FOR STANDBY MODE
- 2A HIGH SIDE DRIVER WITH CLAMPED OUTPUT (16V)
- LOGIC OUTPUT FOR:
 - SUPPLY UNDERVOLTAGE (LVW)
 - OVERVOLTAGE
 - THERMAL PROTECTION
- RESET FUNCTION
- IGNITION COMPARATOR
- REVERSE BATTERY AND LOAD DUMP PROTECTION
- THERMAL SHUTDOWN



The IC includes a monitoring circuit to warn if a low voltage or no voltage condition is occurring.

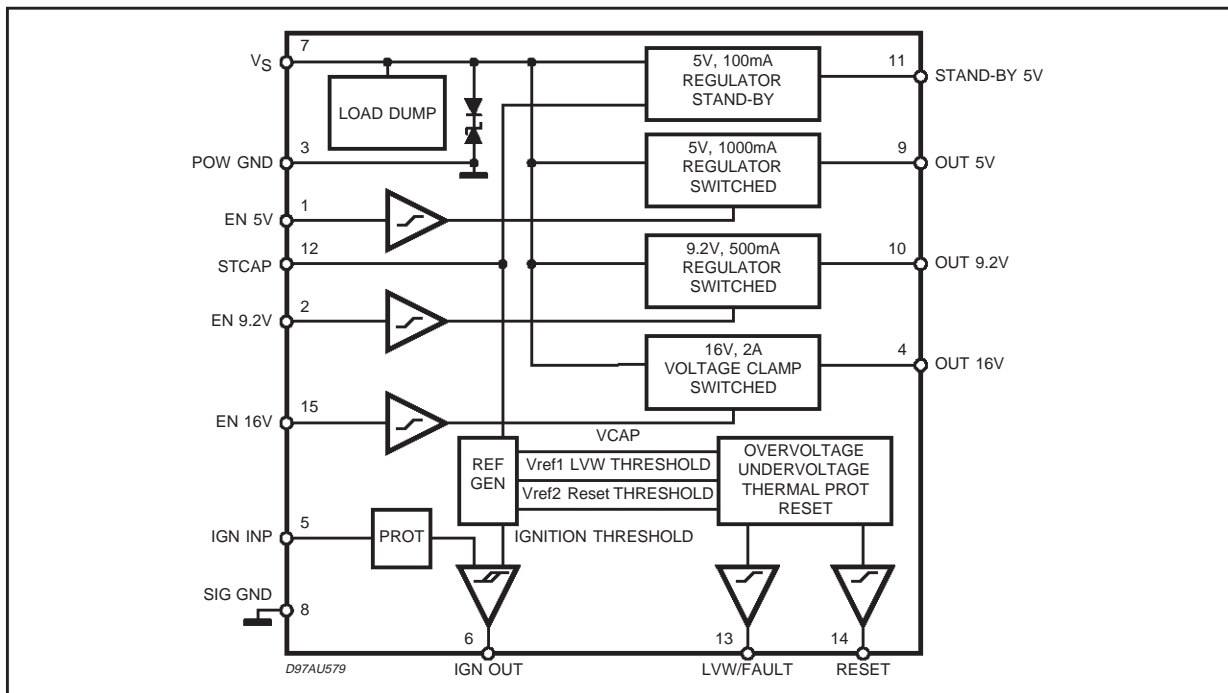
In stand-by output is active as long as possible even when in thermal shutdown or any other fault conditions.

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 μ P to store data.

DESCRIPTION

The L4953G contains a triple voltage regulator and a power switch.

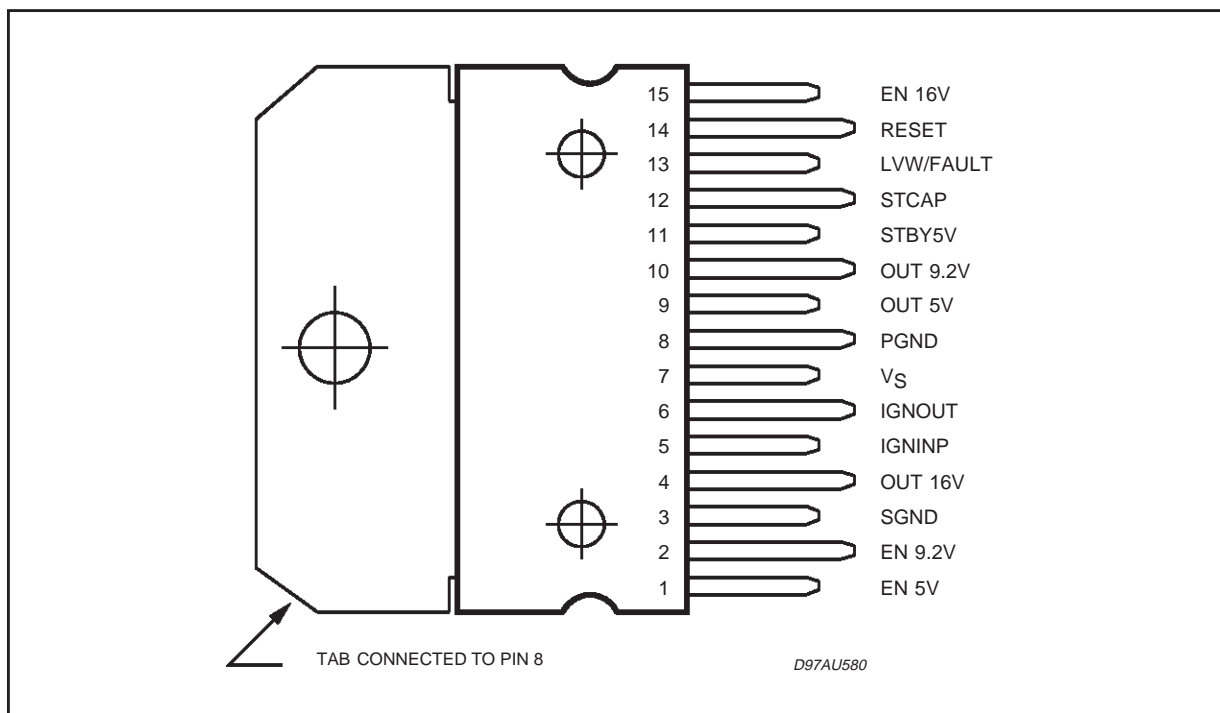
BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|------------------|-----------------------------|--------------------|------|
| V _{SDC} | DC Operating Supply Voltage | -0.6 to 28 | V |
| V _{STR} | Transient Supply Voltage | 50 | V |
| I _o | Output Current | internally limited | |
| T _{op} | Operating Temperature Range | -40 to 85 | °C |
| T _{stg} | Storage Temperature | -55 to 150 | °C |

PIN CONNECTION (Top view)



THERMAL DATA

| Symbol | Parameter | Value | Unit |
|------------------------|----------------------------------|-------|------|
| R _{th j-case} | Thermal Resistance Junction-case | 2 | °C/W |

ELECTRICAL CHARACTERISTICS ($V_S = 14V$, $T_{amb} = -40$ to $85^\circ C$, unless otherwise specified.)

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|--------|--------------------------|-----------------------------------------------------------|------|------|------|---------|
| V_S | Operating Supply Voltage | | 11 | | 18 | V |
| En | Output Noise Voltage | Any reg. supply, $f = 100\text{Hz}$ to 200KHz | | 200 | 400 | μV |

5V STAND-BY OUTPUT VOLTAGE

| | | | | | | |
|--------------------------|------------------------------|-----------------------------------------------------------|------|-----|------|----|
| $V_{5\text{st-by}}$ | Stand-by Output Voltage | | 4.75 | 5 | 5.25 | V |
| ΔV_{line} | Line Regulation | $11V < V_S < 16V$ | | 5 | 50 | mV |
| ΔV_{load} | Load Regulation | $5\text{mA} < I_O < 100\text{mA}$ | | 12 | 100 | mV |
| V_{dropout} | Dropout Voltage | $I_{\text{out}} = 100\text{mA}$ $V_{\text{bat}} = 5.5V$ | | 0.2 | 0.6 | V |
| $I_{\text{qst-by}}$ | Quiescent Current @ Stand-by | $SW < 1.5V$ $5V \text{ ST-BY} = 100\mu A \text{ Load}$ | | 0.3 | 0.65 | mA |

5V/1000mA SWITCHED OUTPUT VOLTAGE

| | | | | | | |
|--------------------------|-------------------|------------------------------------|------|-----|------|-----------|
| $V_{\text{out}5}$ | 5V Output Voltage | no load | 4.75 | 5 | 5.25 | V |
| ΔV_{line} | Line Regulation | $7V < V_S < 18V$ | | 5 | 50 | mV |
| ΔV_{load} | Load Regulation | $5\text{mA} < I_O < 1A$ | | 12 | 50 | mV |
| V_{dropout} | Dropout Voltage | $V_{\text{bat}} = 5.5V$ $I_O = 1A$ | | 1.0 | 1.5 | V |
| I_q | Quiescent Current | $75\text{mA} < I_O < 1A$ | | 30 | 100 | mA |
| I_{lim} | Current Limit | Output Shorted to GND | 1 | 1.3 | | A |
| SW on | Switch ON | $I_O = 75\text{mA}$ | 3.5 | | | V |
| SW off | Switch OFF | | | | 1.5 | V |
| SW hyst | Switch Hysteresis | | 100 | 200 | 500 | mV |
| R_{in} | Input Impedance | | 10 | 40 | | $K\Omega$ |

9.2V/500mA SWITCHED OUTPUT VOLTAGE

| | | | | | | |
|--------------------------|--------------------------|----------------------------------------------------|-----|---------------|-----|-----------|
| $V_{\text{out}9.2}$ | 9.2V Output Voltage | no load | | $9.2 \pm 5\%$ | | V |
| ΔV_{line} | Line Regulation | $11V < V_S < 18V$ | | 5 | 50 | mV |
| ΔV_{load} | Load Regulation | $5\text{mA} < I_O < 500\text{mA}$ | | 12 | 50 | mV |
| V_{dropout} | Dropout Voltage | $5.5V < V_{\text{in}} < 9.2V$ $I_O = 500\text{mA}$ | | 0.4 | 0.9 | V |
| I_q | Quiescent Current | $50\text{mA} < I_O < 500\text{mA}$ | | 10 | 25 | mA |
| I_{lim} | Current Limit | Output Shorted to GND | 500 | 600 | | mA |
| SVR | Supply Voltage Rejection | $f = 3\text{KHz}$ | 45 | 75 | | dB |
| SW on | Switch ON | | 3.5 | | | V |
| SW off | Switch OFF | | | | 1.5 | V |
| SW hyst | Switch Hysteresis | | 100 | 200 | 500 | mV |
| R_{in} | Input Impedance | | 10 | 40 | | $K\Omega$ |

HIGH SIDE DRIVER WITH CLAMPED OUTPUT (16V)

| | | | | | | |
|----------------------|---------------------------|---------------------------------------|------|-----|------|-----------|
| $V_{\text{out}16}$ | Max. Output Voltage | $V_S = 18V$ | 14.6 | | 16.2 | V |
| I_O | Output Continuous Current | $V_S = 16V$ | 2 | | | A |
| V_{dropout} | Dropout Voltage | $5V < V_{\text{in}} < 15V$ $I_O = 2A$ | | 0.5 | 1.0 | V |
| SW on | Switch ON | | 3.5 | | | V |
| SW off | Switch OFF | | | | 1.5 | V |
| SW hyst | Switch Hysteresis | | 100 | 200 | 500 | mV |
| R_{in} | Input Impedance | | 10 | 40 | | $K\Omega$ |

ELECTRICAL CHARACTERISTICS (continued)

FAULT

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Unit |
|-----------------------|----------------------------|----------------|------|------|------|------|
| TH _{fault} | Fault Threshold | | 7 | | 8.5 | V |
| HYST _{fault} | Fault Threshold Hysteresis | | 100 | 200 | 400 | mV |
| OUT _{fault} | Fault Output Voltage | | | | 1.5 | V |
| I _{leak} | Fault Leakage Current | | | | 50 | μA |

RESET

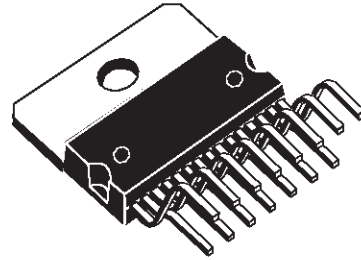
| | | | | | | |
|------------------------|----------------------------|------------------------------------------------------------------|-------|-----|------|--------|
| THON _{reset} | Reset ON Threshold | MIN @ V _{MEM} = 4.75V MAX @ V _{MEM} = 5.25V | 0.938 | | 0.97 | Vst-by |
| THOFF _{reset} | Reset OFF Threshold | | 0.97 | | 0.99 | Vst-by |
| HYST _{reset} | Reset Threshold Hysteresis | | 75 | 175 | 300 | mV |
| OUT _{reset} | Reset Output Voltage | I _{LOAD} = 2mA | | | 1.5 | V |
| I _{leak} | Reset Leakage Current | | | | 5.0 | μA |

IGNITION

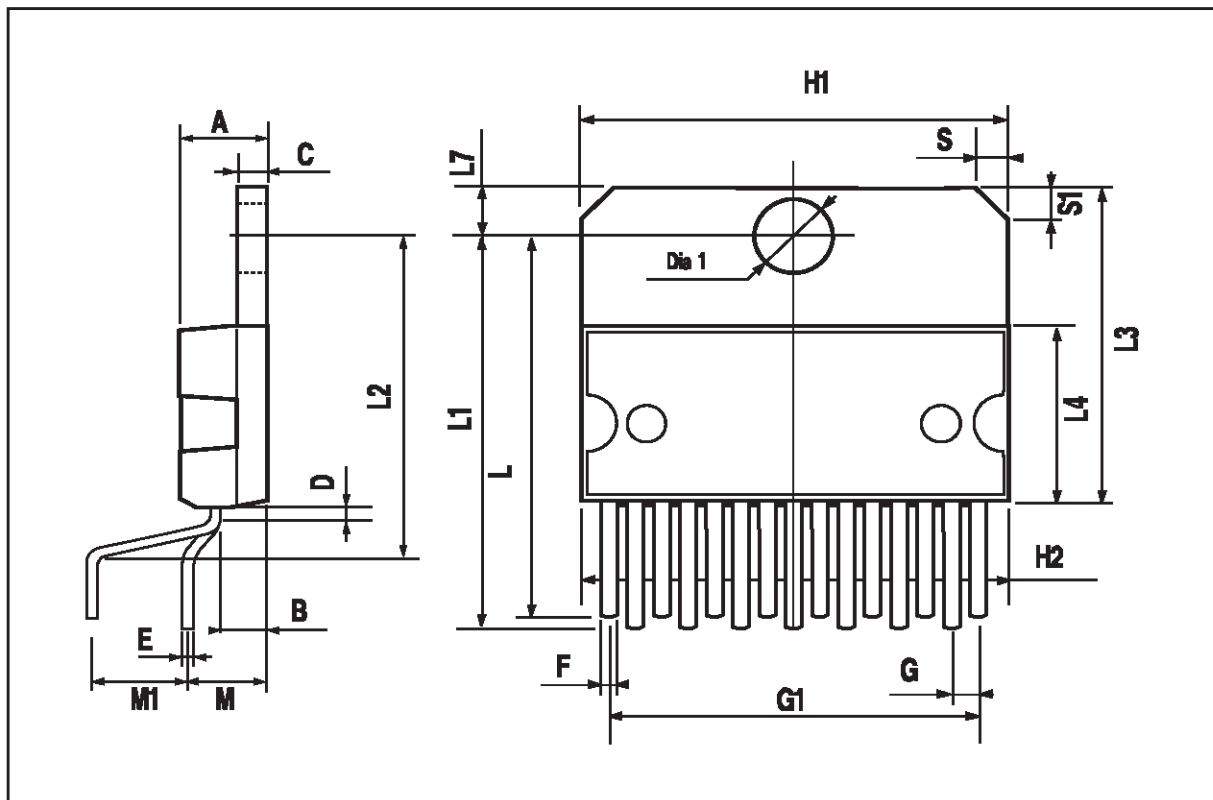
| | | | | | | |
|---------------------|-------------------------------------|--|------|-----|--------|----|
| TH _{ign} | Ign Comparator Positive Threshold | | 5.5 | 6 | 7.5 | V |
| HYST _{ign} | Ign Comparator Threshold Hysteresis | | 100 | 300 | 500 | mV |
| IGN _{high} | Ignition Comparator Output High | | 3.5 | | Vst-by | V |
| IGN _{low} | Ignition Comparator Output Low | | -0.5 | | 1.5 | V |

| 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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