

TDA8137

DUAL 5.1V REGULATOR WITH DISABLE AND RESET

- OUTPUT CURRENTS UP TO 1A
- FIXED PRECISION OUTPUT VOLTAGES 5.1V ± 2%
- OUTPUT 1 WITH RESET FACILITY
- OUTPUT 2 WITH DISABLE BY TTL INPUT
- SHORT CIRCUIT PROTECTION AT BOTH OUTPUTS
- THERMAL PROTECTION
- LOW DROP OUTPUT VOLTAGE

DESCRIPTION

The TDA8137 is a monolithic dual positive voltage regulator designed to provide fixed precision output voltages of 5.1V at currents up to 1A.

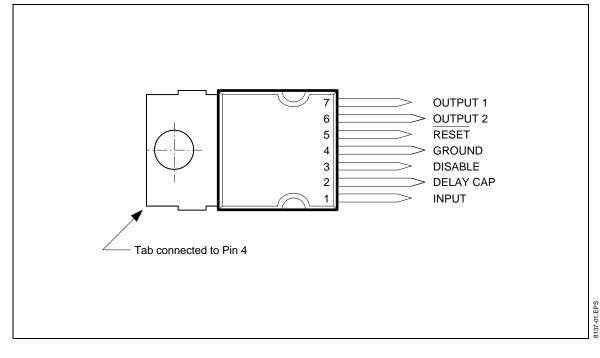
An internal reset circuit generates a reset pulse when the output 1 decreases below the regulated voltage value.

Output 2 can be disabled by TTL input.

Short circuit and thermal protections are included.



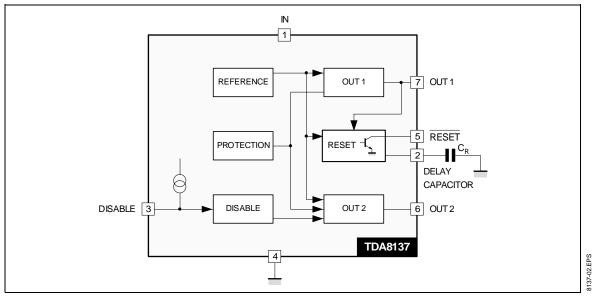
PIN CONNECTION (top view)



September 1993

TDA8137

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|--------------------|-----------------------------|--------------------|------|
| VIN | DC Input Voltage Pin 1 | 20 | V |
| V _{DIS} | Disable Input Voltage Pin 3 | 20 | V |
| V _{RST} | Output Voltage at Pin 5 | 20 | V |
| I _{01, 2} | Output Currents | Internally Limited | |
| Pt | Power Dissipation | Internally Limited | |
| T _{STG} | Storage Temperature | - 65 to + 150 | °C |
| Tj | Junction Temperature | 0 to + 150 | °C |

THERMAL DATA

| Symbol | Parameter | Value | Unit |]_ |
|----------------------|---------------------------------------|------------|------|-------|
| R _{TH(j-c)} | Thermal Resistance Junction-case Max. | 3 | °C/W | 02.TB |
| Tj | Recommended Junction Temperature Max. | 0 to + 150 | °C | 8137- |

ELECTRICAL CHARACTERISTICS ($V_{IN} = 7V$; $T_j = 25^{\circ}C$ unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Тур. | Max. | Unit |
|-------------------------------|--|--|-------|-------|-------|------|
| V _{01, 2} | Output Voltage | I _{01, 2} = 10mA | 5 | 5.1 | 5.2 | V |
| | | $7V < V_{IN} < 14V, 5mA < I_0 < 750mA$ | 4.9 | | 5.3 | V |
| VI 01, 2 | Dropout Voltage | I _{01, 2} = 750mA | | | 1.4 | V |
| | | I _{01, 2} = 1A | | | 2 | V |
| Δ V _{01, 2LI} | Line Regulation | $7V < V_{IN} < 14V, I_{01, 2} = 200 \text{mA}$ | | | 50 | mV |
| Δ V01, 2LO | Load Regulation | 5mA < I _{01, 2} < 0.6A | | | 100 | mV |
| lq | Quiescent Current | I ₀₁ = 10mA, Output 2 Disabled | | | 2 | mA |
| V _{01RST} | Reset Threshold Voltage | (K = V ₀₁) | K–0.4 | K–.25 | K–0.1 | V |
| V _{RTH} | Reset Threshold Hysteresis | (see circuit description) | 20 | 50 | 75 | mV |
| t _{RD} | Reset Pulse Delay at Pin 5 | C _e = 100nF (see circuit description) | | 25 | | ms |
| V _{RL} | Saturation Volt. at Pin 5 in Reset Condition | I ₅ = 5mA | | | 0.4 | V |

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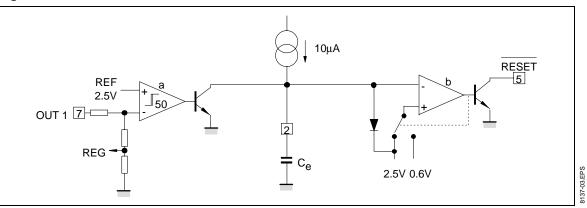


| Symbol | Parameter | Test Conditions | Min. | Тур. | Max. | Unit |
|---------------------|--|---|------|------|------|--------|
| I _{RH} | Leakage Current at Pin 5 in Normal Condition | V ₅ = 10V | | | 10 | μΑ |
| K _{01,2} | Output Volt. Thermal Drift | $\begin{split} K_0 = & \frac{\Delta V_o \cdot 10^6}{\Delta T \cdot V_O} \\ T_j = 0 \text{ to } + 125^\circ C \end{split}$ | | 100 | | ppm/°C |
| I _{01,2SC} | Short Circ. Output Current | $V_{IN} = 7V$ | | | 1.6 | Α |
| | | $V_{IN} = 16V$, (see note 1) | | | 1 | А |
| VDISH | Disable Volt. at Pin 3 High (out 2 active) | | 2 | | | V |
| VDISL | Disable Volt. at Pin 3 Low (out 2 disabled) | | | | 0.8 | V |
| I _{DIS} | Disable Bias Current at Pin 3 | $0V < V_{DIS} < 7V$ | -100 | | 2 | μΑ |
| Tjsd | Junction Temp. for Thermal Shut Down | | | 145 | | °C |

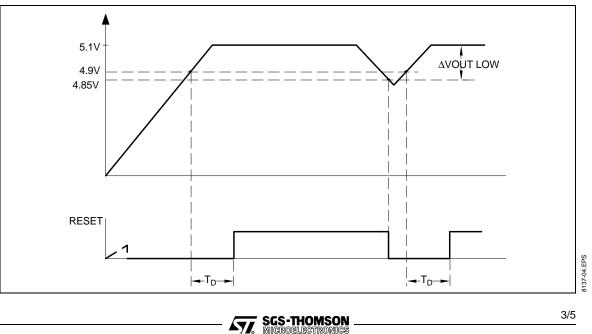
ELECTRICAL CHARACTERISTICS ($V_{IN} = 7V$; $T_j = 25^{\circ}C$ unless otherwise specified) (continued)

Note 1 : The output short circuit currents are tested one channel at time. During a short circuit a large consumption of power occurs, anyway the thermal protection circuit guarantees the temperature not over-comes high value. Safe permanent short-circuit is only guaranteed for input voltages up to 16V.

Figure 1







CIRCUIT DESCRIPTION

The TDA8137 is a dual voltage regulator with Reset and Disable.

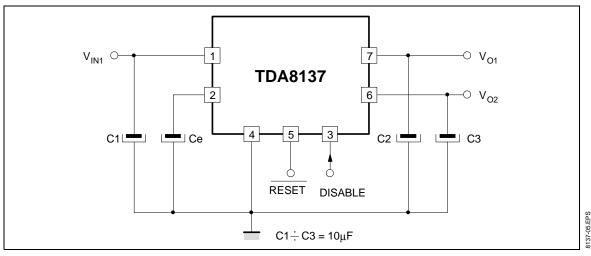
The two regulation parts are supplied from one voltage reference circuit trimmed by zener zap during EWS test. Since the supply voltage of this last is connected at Pin 1 (V_{IN1}), the regulator 2 will not work if the Pin 1 is not supplied.

The outputs stages have been realized in darlington configuration with a drop typical of 1.2V.

The disable circuit, switches off the output 2 if a voltage lower than 0.8V is applied at pin 3.

The Reset circuit checks the voltage at the output 1. If this one goes below V_{OUT} - 0.25V (4.85V Typ.), the comparator "a" (see Figure 1) discharges rapidly the capacitor Ce and the reset output goes at once low. When the voltage at the OUT 1 rises above V_{OUT} -0.2V (4.9V Typ.), the voltage V_{Ce} increases linearly to 2.5V corresponding to a delay t_d following the low : t_d = $\frac{Ce \cdot 2.5V}{10\mu A}$ (see figure 2), then the reset output goes high again. To avoid glitches in the reset output, the second comparator "b" has a large hysteresis (1.9V).

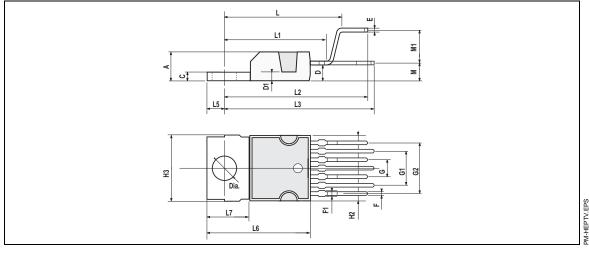
TYPICAL APPLICATION





PACKAGE MECHANICAL DATA

9 PINS - PLASTIC HEPTAWATT



| Dimensions | Millimeters | | | Inches | | | |
|------------|-------------|-------|------|--------|-------|-------|--|
| | Min. | Тур. | Max. | Min. | Тур. | Max. | |
| A | | | 4.8 | | | 0.189 | |
| С | | | 1.37 | | | 0.054 | |
| D | 2.4 | | 2.8 | 0.094 | | 0.110 | |
| D1 | 1.2 | | 1.35 | 0.047 | | 0.053 | |
| E | 0.35 | | 0.55 | 0.014 | | 0.022 | |
| F | 0.6 | | 08 | 0.024 | | 0.031 | |
| F1 | | | 0.9 | | | 0.035 | |
| G | 2.41 | 2.54 | 2.67 | 0.095 | 0.100 | 0.105 | |
| G1 | 4.91 | 5.08 | 5.21 | 0.193 | 0.200 | 0.205 | |
| G2 | 7.49 | 7.62 | 7.8 | 0.295 | 0.300 | 0.307 | |
| H2 | | | 10.4 | | | 0.409 | |
| H3 | 10.05 | | 10.4 | 0.396 | | 0.409 | |
| L | | 16.97 | | | 0.668 | | |
| L1 | | 14.92 | | | 0.587 | | |
| L2 | | 21.54 | | | 0.848 | | |
| L3 | | 22.62 | | | 0.891 | | |
| L5 | 2.6 | | 3 | 0.102 | | 0.118 | |
| L6 | 15.1 | | 15.8 | 0.594 | | 0.622 | |
| L7 | 6 | | 6.6 | 0.236 | | 0.260 | |
| М | | 2.8 | | | 0.110 | | |
| M1 | | 5.08 | | | 0.200 | | |
| Dia. | 3.65 | | 3.85 | 0.144 | | 0.152 | |

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