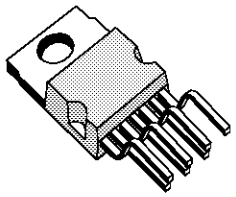
SGS-THOMSON MICROELECTRONICS

# TDA8135

## 5V + ADJUSTABLE VOLTAGE REGULATOR WITH DISABLE

- OUTPUT CURRENTS UP TO 600mA
- FIXED PRECISION OUTPUT 1 VOLTAGE 5V ± 2%
- OUTPUT 2 - VOLTAGE PROGRAMMABLE FROM 5V TO 14V
- OUTPUT 2 VOLTAGE DISABLED BY A TTL INPUT
- SHORT CIRCUIT PROTECTION AT BOTH OUTPUTS
- THERMAL PROTECTION
- LOW DROP OUT 1.5V AT 400mA
- HIGH SUPPLY VOLTAGE REJECTION



**HEPTAWATT**
(Plastic Package)

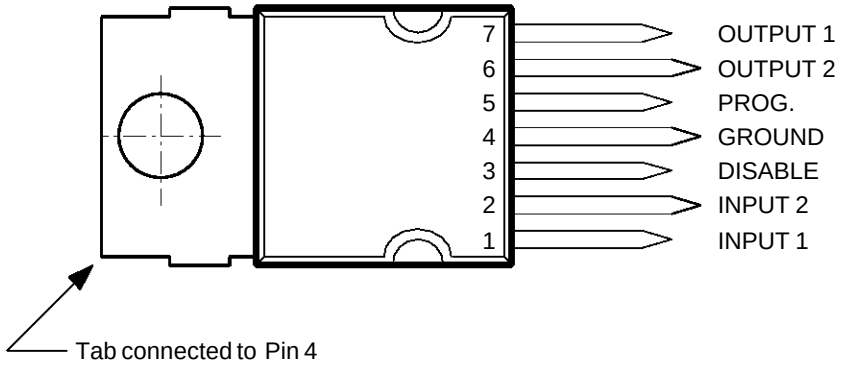
**ORDER CODE :** TDA8135

### DESCRIPTION

The TDA8135 is a monolithic dual positive voltage regulator designed to provide fixed precision output voltages, 5V + adjustable outputs at currents up to 600mA.

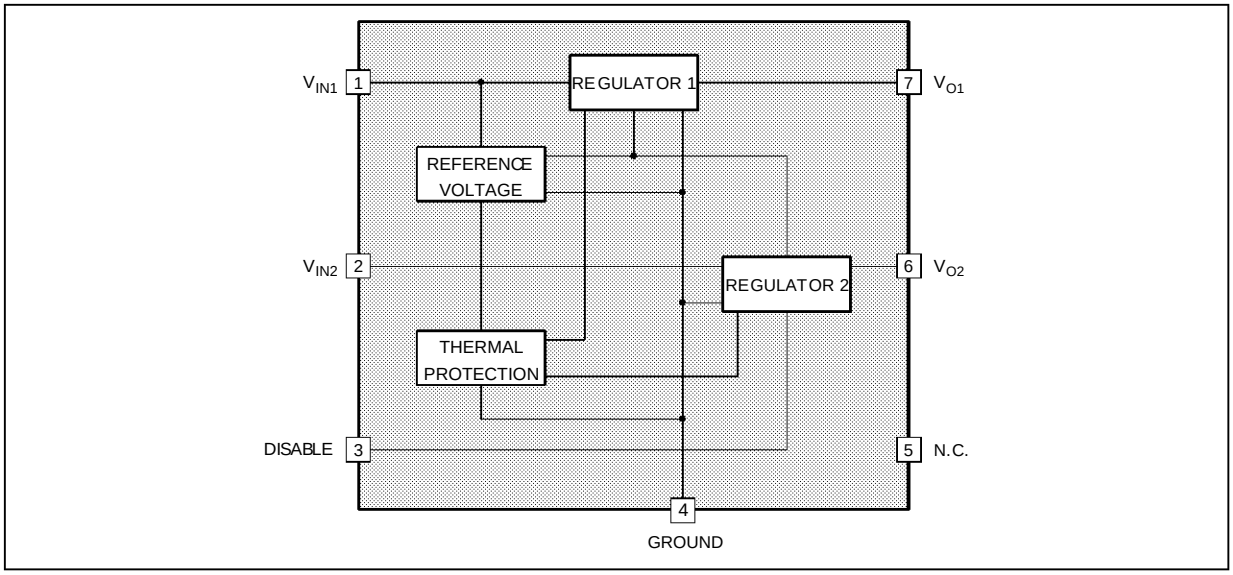
Output 2 can be disabled by a TTL input. Both output currents are limited by an internal short circuit protection.

### PIN CONNECTIONS




8135-01.EPS

## BLOCK DIAGRAM

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## ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{IN1,\ 2}$ | DC Input Voltages | 24 | V |
| $V_{DIS}$ | Disable Input Voltage Pin 3 | 24 | V |
| $I_{O1,\ 2}$ | Output Currents | Internally Limited | |
| $P_t$ | Power Dissipation | Internally Limited | |
| $T_{STG}$ | Storage Temperature | – 65 to + 150 | °C |
| $T_j$ | Junction Temperature | 0 to + 150 | °C |

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## THERMAL DATA

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{TH(j-c)}$ | Thermal Resistance Junction-case | Max. | 3 | °C/W |

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## ELECTRICAL CHARACTERISTICS

($V_{IN1}$ = 7V ; $V_{IN2}$ = $V_{O2}$ + 2V ; $V_{DIS}$ = 2.5V ; $I_{O1,2}$ = 0 ; $T_j$ = 25°C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{O1}$ | Output Voltage at Pin 7 | | 4.9 | 5 | 5.1 | V |
| $V_{O2}$ | Output Voltage at Pin 6 | Adustable | 5 | | 14 | V |
| $I_{Q1}$ | Quiescent Current | $V_{IN2}$ = 0, $V_{DIS}$ = 0<br>$I_{O1}$ = 10mA, (see fig. 1) | | | 2 | mA |
| $I_{Q2}$ | Quiescent Current | $I_{O2}$ = 10mA (see fig. 1) | | | 2 | mA |
| $V_{IN1}$-$V_{O1}$ | Drop Out Voltage 1 | $I_{O1}$ = 400mA | | | 1.5 | V |
| $V_{IN2}$-$V_{O2}$ | Drop Out Voltage 2 | $I_{O2}$ = 400mA | | | 1.5 | V |
| $\Delta V_{O1LI}$ | Line Regulation 1 | 7V < $V_{IN1}$ <14V, $I_{O1}$ = 200mA | | | 90 | mV |
| $\Delta V_{O2LI}$ | Line Regulation 2 | 12V < $V_{IN2}$ <20V, $I_{O2}$ = 200mA<br>$V_{O2}$ = 10V | | | 120 | mV |
| $\Delta V_{O1LO}$ | Load Regulation 1 | 0 < $I_{O1}$ <600mA | | | 100 | mV |
| $\Delta V_{O2LO}$ | Load Regulation 2 | 0 < $I_{O2}$ <600mA, $V_{O2}$ = 10V | | | 200 | mV |

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**ELECTRICAL CHARACTERISTICS** (continued)

($V_{IN1}$ = 7V ; $V_{IN2}$ = $V_{O2}$ + 2V ; $V_{DIS}$ = 2.5V ; $I_{O1,2}$ = 0 ; $T_j$ = 25°C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_{O1SC}$ | Short Circuit Current 1 | 7V < $V_{IN1}$ <14V | | | 1.3 | A |
| $I_{O2SC}$ | Short Circuit Current 2 | $V_{O2}$ + 2V < $V_{IN2}$ <20V | | | 1.3 | A |
| $V_{DISH}$ | Disable Voltage HIGH at Pin 3 | | 2 | | | V |
| $V_{DISL}$ | Disable Voltage LOW at Pin 3 | | | | 0.8 | V |
| $V_{PROG}$ | Reference Voltage at Pin 5 | | | 2.5 | | V |
| $I_{DISH}$ | Bias Current at Pin 3 | $V_{DIS}$ = 5.3V | | | 10 | µA |
| $I_{DISL}$ | Bias Current at Pin 3 | $V_{DIS}$ = 0.4V | –80 | | | µA |
| $SVR_1$ | Supply Voltage Rejection 1 (see note 1) | $V_{IN1}$ = $9V_{DC}$ + $1V_{PP}$ SIN f = 120Hz, $I_{O1}$ = 200mA | 50 | | | dB |
| $SVR_2$ | Supply Voltage Rejection2 (see note 1) | $V_{IN2}$ = $16V_{DC}$ + $1V_{PP}$ SIN f = 120Hz, $I_{O2}$ = 200mA | 50 | | | dB |
| $I_Q$ | Quiescent Current | $I_{O1}$ = $I_{O2}$ =200mA | | | 6 | mA |
| $T_{JSD}$ | Thermal Shut-down Junction Temperature | | | 145 | | °C |

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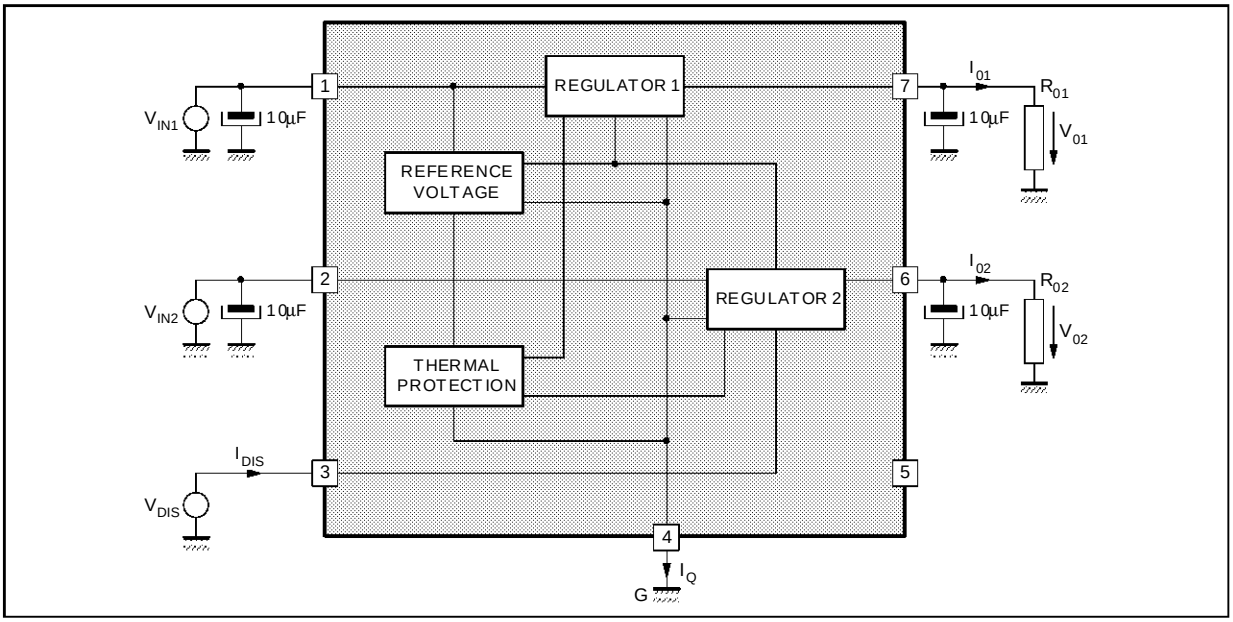
**Note 1 :** SVR supply voltage rejection :

$$20 \cdot LOG \cdot \left| \frac{V_{IN\,ac}}{V_{O\,ac}} \right|$$

where :
$V_{IN\,ac}$ is the value of the sinusoidal signal forced at the input. (120Hz, $1V_{PP}$)
$V_{O\,ac}$ is the peak-peak ripple voltage present at the output

**Figure 1 :** Test Circuit

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## CIRCUIT DESCRIPTION

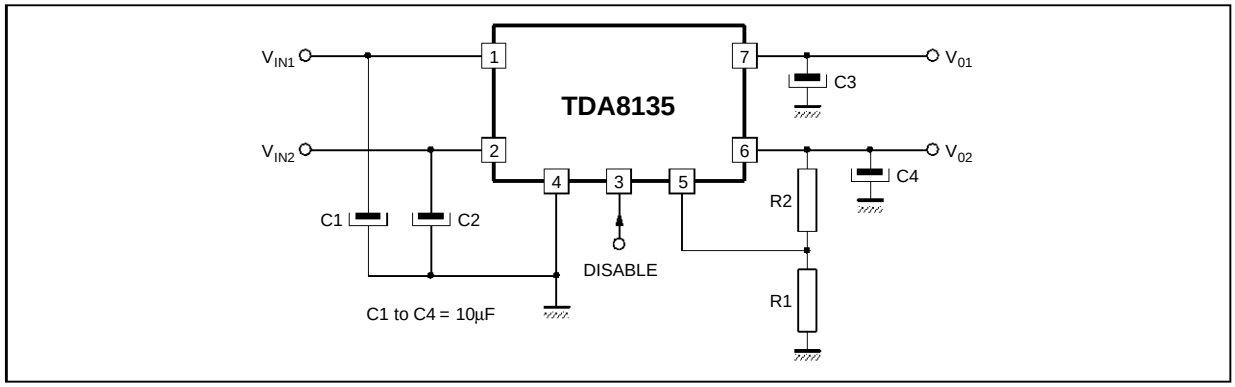
The TDA8135 is a dual voltage regulator with disable.

The two regulation parts are supplied from one vol-tage 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.

It is possible to switch-off the output voltage 2 ($V_{O2}$) by appling at Pin 3 (disable input) a low TTL level.

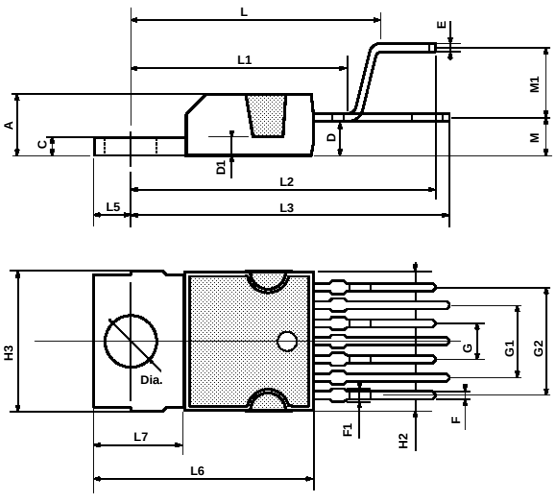
$$V_{02} = V_{PROG} \cdot \frac{R1 + R2}{R1}$$

## TYPICAL APPLICATION



## PACKAGE MECHANICAL DATA

9 PINS - PLASTIC HEPTAWATT




PM-HEPTV.EPS

| Dimensions | Millimeters | | | Inches | | |
|---|---|---|---|---|---|---|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 4.8 | | | 0.189 |
| C | | | 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 |
| M | | 2.8 | | | 0.110 | |
| M1 | | 5.08 | | | 0.200 | |
| Dia. | 3.65 | | 3.85 | 0.144 | | 0.152 |

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