



3A Adjustable Low-Dropout Linear Regulator

Features

- Available in Adjust Version
- Space Saving TO-252 Package and TO-263 Package
- Internal Short Circuit Current Limiting
- Internal Over Temperature Protection
- Output Current 3A

Applications

- Post Regulation for Switching DC/DC Converter
- High Efficiency Linear Regulator
- Battery Charger
- Battery Powered Instrumentation
- Motherboard

General Description

The G1085 is a low dropout linear regulator with a dropout of 1.2V at 3A of load current. It is available in an adjustable version, which can set the output from 1.25V to 5V with only two external resistors.

The G1085 provides over temperature and over current protection circuits to prevent it from being damaged by abnormal operating conditions.

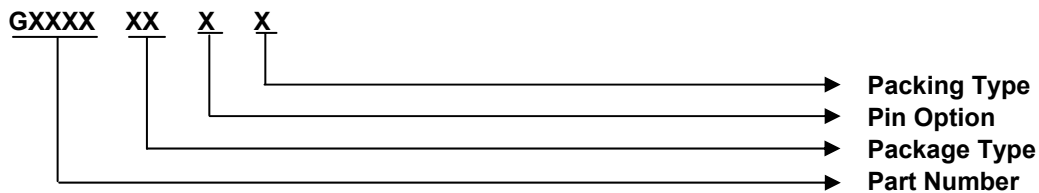
The G1085 is available in TO-252 package and TO-263 packages. A minimum of 100 μ F tantalum electrolytic capacitor is required at the output to improve the transient response and stability.

Ordering Information

| ORDER NUMBER | ORDER NUMBER (Pb free) | MARKING | TEMP. RANGE | PACKAGE | PIN OPTION | | |
|--------------|------------------------|---------|----------------|---------|------------|------------------|-----------------|
| | | | | | 1 | 2 | 3 |
| G1085T43U | G1085T43Uf | G1085 | -40°C to +85°C | TO-252 | GND/ADJ | V _{OUT} | V _{IN} |
| G1085T53U | G1085T53Uf | G1085 | -40°C to +85°C | TO-263 | GND/ADJ | V _{OUT} | V _{IN} |

* For other package types and pin options, please contact us at sales @gmt.com.tw

Order Number Identification



PACKAGE TYPE

T4: TO-252
T5: TO-263

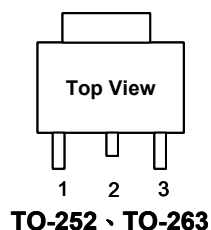
PIN OPTION

1 2 3
3: GND/ADJ V_{OUT} V_{IN}

PACKING

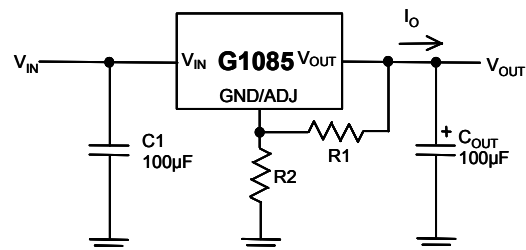
U & D: Tape & Reel Direction
T: Tube

Package Type



Typical Application

[Note 4]: Type of C_{OUT}



**Absolute Maximum Ratings** (Note 1)

| | |
|---|---------------------------------|
| Input Voltage..... | 7V |
| Power Dissipation Internally Limited (Note 2) | |
| Maximum Junction Temperature..... | 150°C |
| Storage Temperature Range..... | -65°C ≤ T _J ≤ +150°C |
| Reflow Temperature (soldering, 10sec)..... | 260°C |
| Thermal Resistance Junction to Ambient | |
| TO-252 ⁽¹⁾ | 125°C/W |
| TO-263 ⁽¹⁾ | 100°C/W |
| Thermal Resistance Junction to Case | |
| TO-252..... | 10°C/W |
| TO-263..... | 6°C/W |
| ESD Rating (Human Body Model)..... | 2kV |

Note ⁽¹⁾: See Recommended Minimum Footprint

Operating Conditions (Note 1)

| | |
|---|-------------------------------|
| (V _{IN} -V _{ADJ}) Voltage..... | 2.5V~5.5V |
| Temperature Range..... | -40°C ≤ T _A ≤ 85°C |

Electrical Characteristics

Operating Conditions: V_{IN} ≤ 7V, T_A = T_J = 25°C unless otherwise specified. [Note3]

| PARAMETER | CONDITION | MIN | TYP | MAX | UNIT |
|---|---|-------|-------|-------|------|
| Reference Voltage | V _{IN} - V _{OUT} = 2V, I _{OUT} = 10mA | 1.225 | 1.250 | 1.275 | V |
| Line Regulation | (V _{OUT} + 1.5V) ≤ V _{IN} ≤ 7V, I _{OUT} = 10mA | --- | 0.5 | 1 | % |
| Load Regulation | (V _{IN} - V _{OUT}) = 2V, 10mA ≤ I _{OUT} ≤ 3A | --- | 0.04 | 0.5 | % |
| Dropout Voltage | ΔV _{OUT} = 2%, I _{OUT} = 3A | --- | 1.3 | 1.4 | V |
| Current Limit | (V _{IN} - V _{OUT}) = 2V | --- | 5.4 | --- | A |
| Adjust Pin Current Change | V _{IN} - V _{OUT} = 2V, 10mA ≤ I _{OUT} ≤ 3A | --- | 0.15 | --- | μA |
| Minimum Load Current | 1.5V ≤ (V _{IN} - V _{OUT}) ≤ 5.25V | 10 | --- | --- | mA |
| Quiescent Current | V _{IN} - V _{OUT} = 2V | --- | 80 | 150 | μA |
| Ripple Rejection | f = 120Hz, C _{OUT} = 10μF Tantalum, (V _{IN} - V _{OUT}) = 3V, I _{OUT} = 1A | --- | 48 | --- | dB |
| Temperature Stability | V _{IN} = 4V, I _O = 10mA | --- | 0.3 | --- | % |
| RMS Output Noise (% of V _{OUT}) | T _A = 25°C, 10Hz ≤ f ≤ 10kHz, I _{LOAD} = 10mA | --- | 0.007 | --- | % |
| Thermal Shutdown | Junction Temperature | --- | 150 | --- | °C |
| Thermal Shutdown Hysteresis | | --- | 30 | --- | °C |

Note 1: Absolute Maximum Ratings are limits beyond which damage to the device may occur. Operating Conditions are conditions under which the device functions but the specifications might not be guaranteed. For guaranteed specifications and test conditions see the Electrical Characteristics.

Note2: The maximum power dissipation is a function of the maximum junction temperature, T_{Jmax}; total thermal resistance, θ_{JA}, and ambient temperature T_A. The maximum allowable power dissipation at any ambient temperature is T_{Jmax}-T_A / θ_{JA}. If this dissipation is exceeded, the die temperature will rise above 150°C and IC will go into thermal shutdown.

Note3: Low duty pulse techniques are used during test to maintain junction temperature as close to ambient as possible.

Note4: The type of output capacitor should be tantalum or aluminum.

**Definitions****Output Voltage**

The G1085 provides an adjustable output voltage from 1.25V to 5V. with two external resistors. It can be formulated as:

$$V_{OUT} = 1.25V \times \left(1 + \frac{R_2}{R_1}\right) + I_{ADJ} \times R_2$$

$$I_{ADJ} = 80\mu A \text{ (TYP)}$$

Dropout Voltage

The input/output Voltage differential at which the regulator output no longer maintains regulation against further reductions in input voltage. Measured when the output drops 2% below its nominal value. Dropout voltage is affected by junction temperature, load current and minimum input supply requirements.

Line Regulation

The change in output voltage for a change in input voltage. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

Load Regulation

The change in output voltage for a change in load current at constant chip temperature. The measurement is made under conditions of low dissipation or by using pulse techniques such that average chip temperature is not significantly affected.

Maximum Power Dissipation

The maximum total device dissipation for which the regulator will operate within specifications.

Quiescent Bias Current

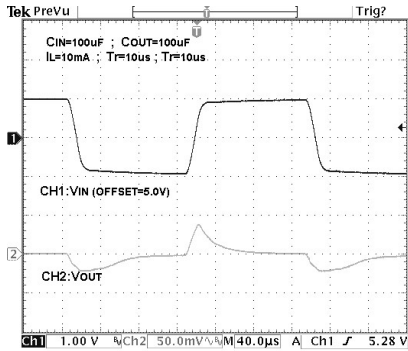
Current which is used to operate the regulator chip and is not delivered to the load.



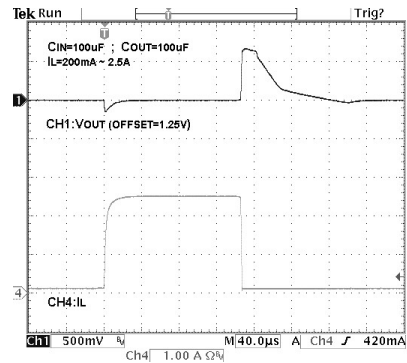
Typical Performance Characteristics

($V_{IN}-V_{OUT}=3V$, $V_{OUT}=1.25V$, $C_{IN}=100\mu F$, $C_{OUT}=100\mu F$, $T_A=25^\circ C$, unless otherwise noted.)

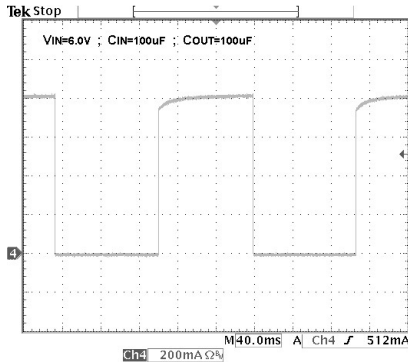
Line Transient Response



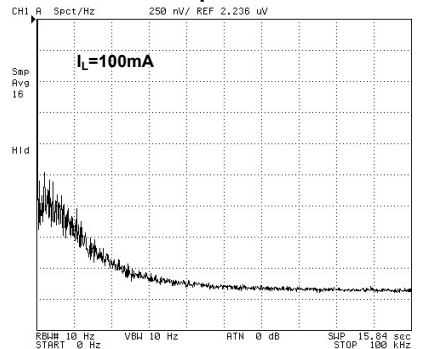
Load Transient Response



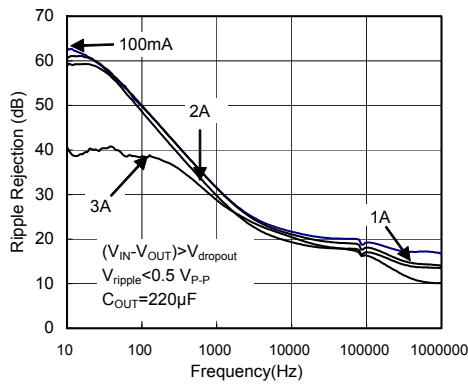
Short Circuit-Current



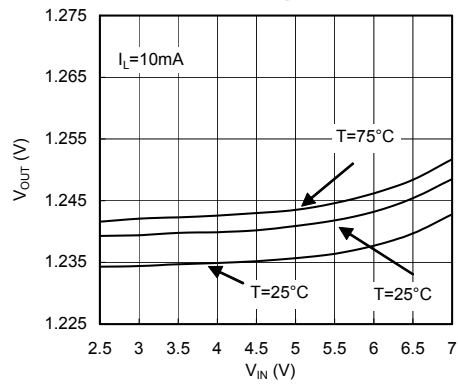
Output Noise



Ripple Rejection



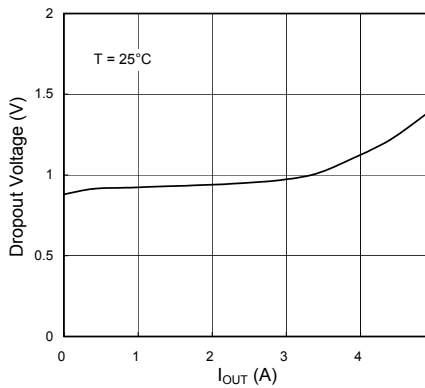
Line Regulation



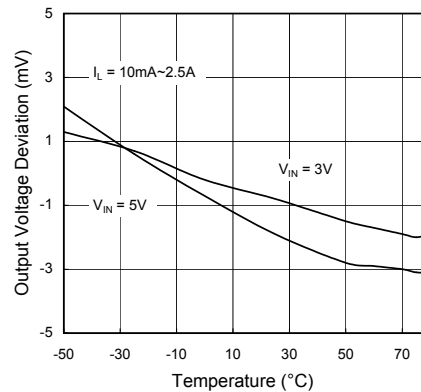


Typical Performance Characteristics (continued)

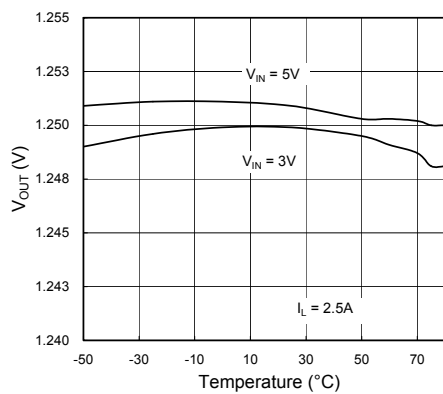
Dropout Voltage vs. I_{OUT}



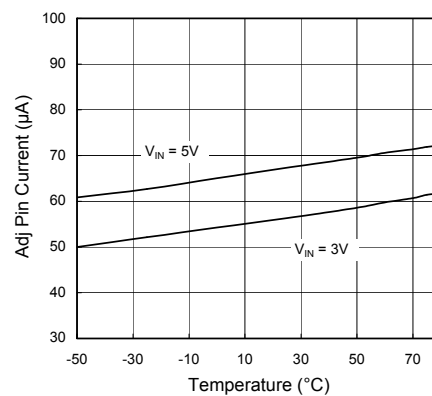
Load Regulation



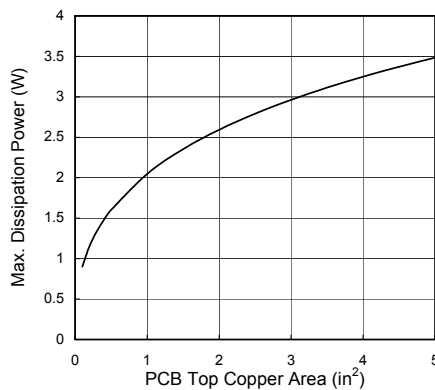
Output Voltage vs. Temperature



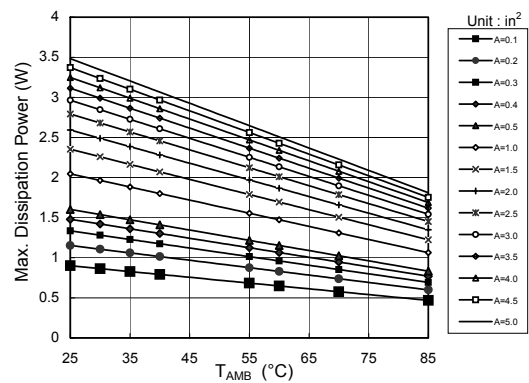
Adj Pin Current vs. Temperature



G1085T43(TO-252) Max. Power Dissipation vs. PCB Top Copper Area T_{AMB} = 25°C ; Still Air

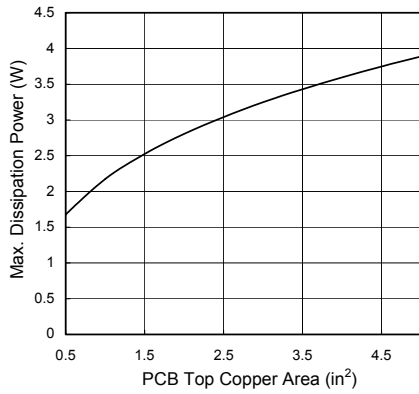


G1085T43(TO-252) Max. Power Dissipation vs. T_{AMB} (still air) (Different PCB Top Copper Area)

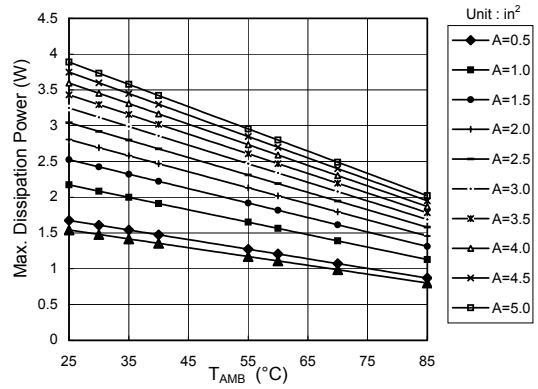


Typical Performance Characteristics (continued)

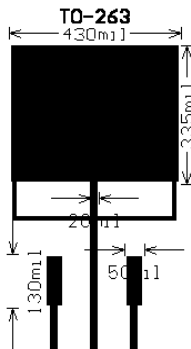
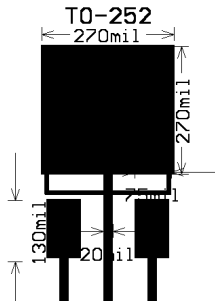
G1085T53(TO-263) Max. Power Dissipation vs. PCB Top Copper Area
 Area $T_{AMB} = 25^{\circ}\text{C}$; Still Air



G1085T53(TO-263) Max. Power Dissipation vs. T_{AMB} (still air)
 (Different PCB Top Copper Area)

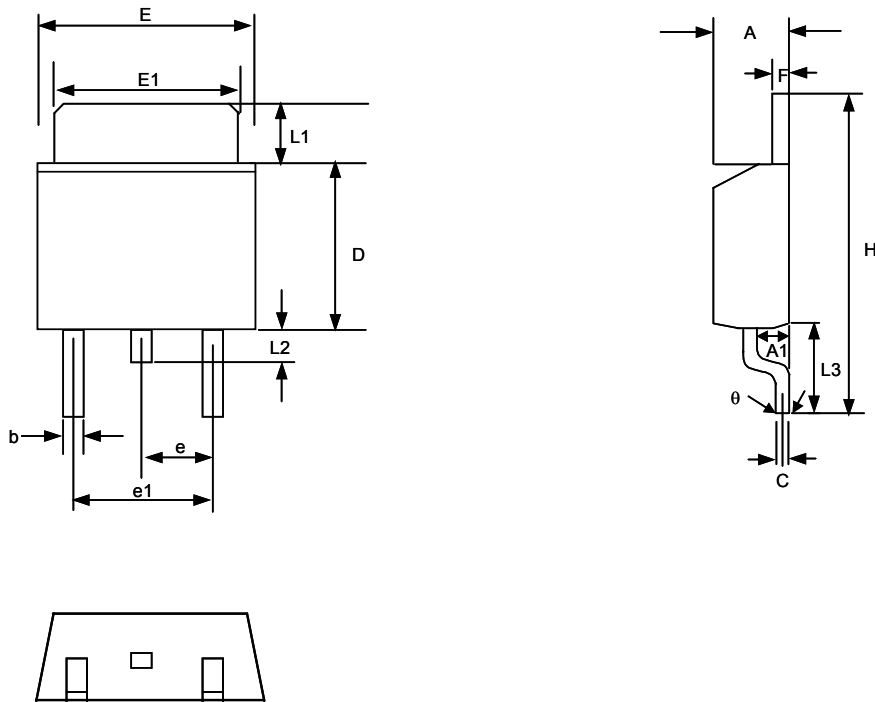


Recommend Minimum Footprint



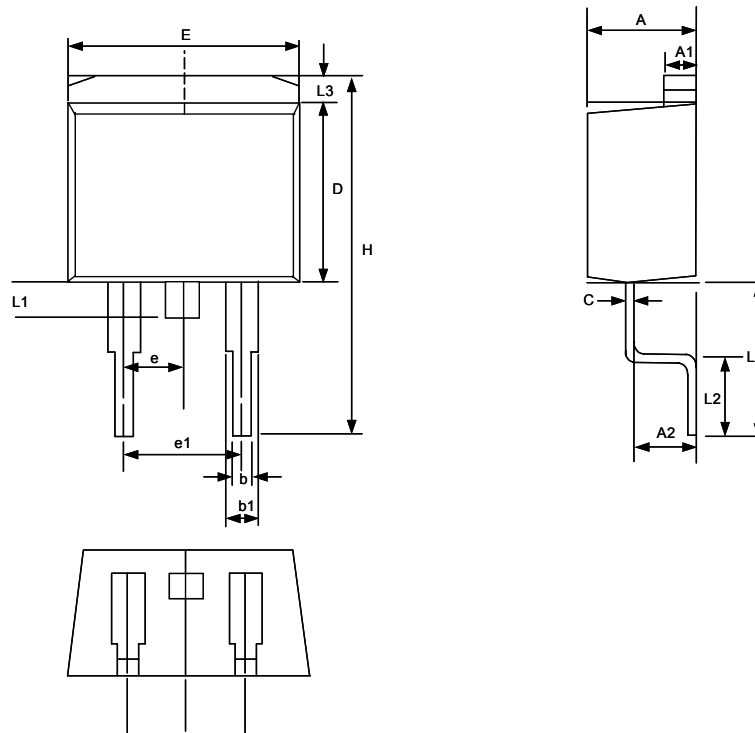


Package Information



TO-252 (T4) Package

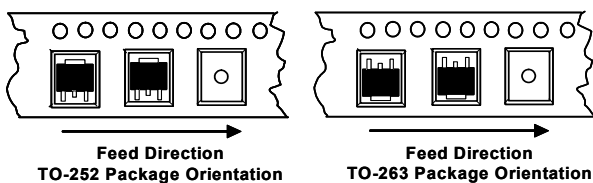
| SYMBOL | DIMENSION IN MILLIMETER | | DIMENSION IN INCH | |
|----------|-------------------------|-------|-------------------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 2.19 | 2.38 | 0.086 | 0.094 |
| A1 | 0.89 | 1.27 | 0.035 | 0.050 |
| b | 0.64 | 0.89 | 0.025 | 0.035 |
| C | 0.46 | 0.58 | 0.018 | 0.023 |
| D | 5.97 | 6.22 | 0.235 | 0.245 |
| E | 6.35 | 6.73 | 0.250 | 0.265 |
| E1 | 5.21 | 5.46 | 0.205 | 0.215 |
| e | 2.26 BSC | | 0.09 BSC | |
| e1 | 3.96 | 5.18 | 0.156 | 0.204 |
| F | 0.46 | 0.58 | 0.018 | 0.023 |
| L1 | 0.89 | 2.03 | 0.035 | 0.080 |
| L2 | 0.64 | 1.02 | 0.025 | 0.040 |
| L3 | 2.40 | 2.80 | 0.095 | 0.110 |
| H | 9.40 | 10.40 | 0.370 | 0.410 |
| θ | 0° | 4° | 0° | 4° |



TO-263 (T5) Package

| SYMBOL | MILLIMETER | | INCH | |
|--------|------------|-------|----------|-------|
| | MIN | MAX | MIN | MAX |
| A | 4.30 | 4.70 | 0.169 | 0.185 |
| A1 | 1.22 | 1.32 | 0.048 | 0.055 |
| A2 | 2.45 | 2.69 | 0.104 | 0.106 |
| b | 0.69 | 0.94 | 0.027 | 0.037 |
| b1 | 1.22 | 1.40 | 0.048 | 0.055 |
| C | 0.36 | 0.56 | 0.014 | 0.022 |
| D | 8.64 | 9.652 | 0.340 | 0.380 |
| E | 9.70 | 10.54 | 0.382 | 0.415 |
| e | 2.29 | 2.79 | 0.090 | 0.110 |
| e1 | 4.83 | 5.33 | 0.190 | 0.210 |
| H | 14.60 | 15.78 | 0.575 | 0.625 |
| L | 4.70 | 5.84 | 0.185 | 0.230 |
| L1 | 1.20 | 1.778 | 0.047 | 0.070 |
| L2 | 2.24 | 2.84 | 0.088 | 0.111 |
| L3 | 1.40MAX | | 0.055MAX | |

Package Orientation



| PACKAGE | Q'TY/REEL |
|---------|-----------|
| TO-252 | 2,500 ea |
| TO-263 | 1,000 ea |

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