



5A Low-Dropout Linear Regulator

Features

- Available in 1.5V, 1.8V, 2.5V, 3.3V version
- TO-252, TO-263 package
- Internal short circuit current limiting
- Internal over temperature protection
- Output current 5A

Applications

- Post regulation for switching DC/DC converter
- High efficiency linear regulator
- Battery powered instrumentation
- Motherboard

General Description

The G1084-XX is a low dropout linear regulator with a dropout of 1.3V at 5A of load current. It is available in three fixed voltages: 1.5V, 1.8V, 2.5V and 3.3V. Refer to the G1084 for the adjustable version.

The G1084-XX provides over temperature and over current protection circuits to prevent it from being damaged by abnormal operating conditions.

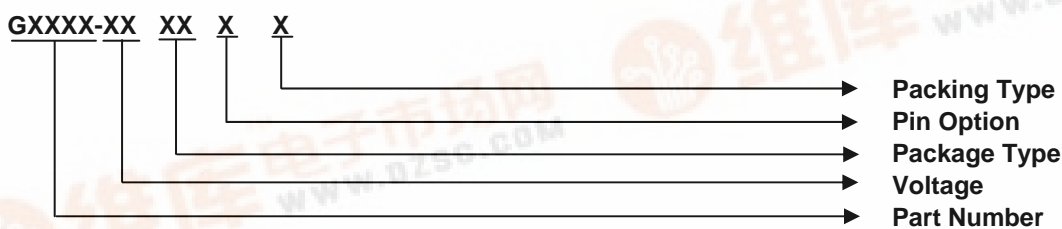
The G1084-XX is available in TO-252 and TO-263 packages. A minimum of 220µF tantalum electrolytic capacitor is required at the output to improve the transient response and stability.

Ordering Information

| ORDER NUMBER | ORDER NUMBER (Pb free) | MARKING | TEMP. RANGE | PACKAGE | PIN OPTION | | |
|--------------|------------------------|----------|----------------|---------|------------|------------------|-----------------|
| | | | | | 1 | 2 | 3 |
| G1084-15T43U | G1084-15T43Uf | G1084-15 | -40°C to +85°C | TO-252 | GND | V _{OUT} | V _{IN} |
| G1084-18T43U | G1084-18T43Uf | G1084-18 | -40°C to +85°C | TO-252 | GND | V _{OUT} | V _{IN} |
| G1084-25T43U | G1084-25T43Uf | G1084-25 | -40°C to +85°C | TO-252 | GND | V _{OUT} | V _{IN} |
| G1084-33T43U | G1084-33T43Uf | G1084-33 | -40°C to +85°C | TO-252 | GND | V _{OUT} | V _{IN} |
| G1084-15T53U | G1084-15T53Uf | G1084-15 | -40°C to +85°C | TO-263 | GND | V _{OUT} | V _{IN} |
| G1084-18T53U | G1084-18T53Uf | G1084-18 | -40°C to +85°C | TO-263 | GND | V _{OUT} | V _{IN} |
| G1084-25T53U | G1084-25T53Uf | G1084-25 | -40°C to +85°C | TO-263 | GND | V _{OUT} | V _{IN} |
| G1084-33T53U | G1084-33T53Uf | G1084-33 | -40°C to +85°C | TO-263 | GND | 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

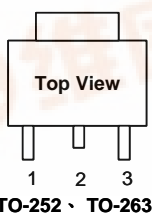
PIN OPTION

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

PACKING

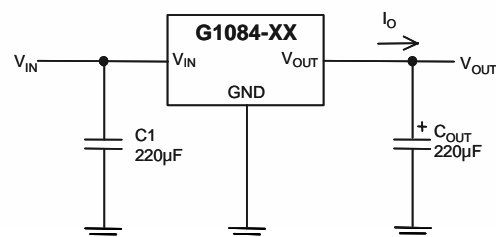
U: Tape & Reel

Package Type



Typical Application

[Note 4]: Type of C_{OUT}



**Absolute Maximum Ratings** (Note 1)

| | |
|--|---------------------------------|
| Input Voltage | .8V |
| 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⁾ | 95°C/W |
| TO-263 ⁽¹⁾ | 92°C/W |
| Thermal Resistance Junction to Case | |
| TO-252 | 8°C/W |
| TO-263 | 6°C/W |
| ESD Rating (Human Body Model) | .2kV |

Note ⁽¹⁾: See Recommended Minimum Footprint

Operating Conditions (Note 1)

| | |
|-------------------|-------------------------------|
| Input Voltage | 2.2V~7V |
| Temperature Range | -40°C ≤ T _A ≤ 85°C |

Electrical Characteristics

V_{IN} = 5V, C_{IN} = C_{OUT} = 220μF, T_A = T_J = 25°C unless otherwise specified. (Note3)

| PARAMETER | CONDITION | MIN | TYP | MAX | UNIT |
|-----------------------|--|-----|----------------|-----|------|
| Output Voltage | 10mA ≤ I _{OUT} ≤ 5A | -2% | V _O | 2% | V |
| Line Regulation | (V _{OUT} + 0.7V) ≤ V _{IN} ≤ 5.5V, I _{OUT} = 10mA | --- | 0.1 | --- | % |
| Load Regulation | G1084-18 V _{IN} = 3.8V, 10mA ≤ I _{OUT} ≤ 5A | --- | 1 | --- | % |
| | G1084-25 V _{IN} = 5V, 10mA ≤ I _{OUT} ≤ 5A | | | | |
| | G1084-33 V _{IN} = 5V, 10mA ≤ I _{OUT} ≤ 5A | | | | |
| Dropout Voltage | G1084-18 ΔV _{OUT} = 2%, I _{OUT} = 5A | --- | 1.6 | --- | V |
| | G1084-25 ΔV _{OUT} = 2%, I _{OUT} = 5A | --- | 1.3 | --- | |
| | G1084-33 ΔV _{OUT} = 2%, I _{OUT} = 5A | --- | 1.1 | --- | |
| Current Limit | (V _{IN} - V _{OUT}) = 2V | --- | 5.5 | --- | A |
| Short Circuit Current | | --- | 1 | --- | A |
| Quiescent Current | G1084-18 V _{IN} = 5V | --- | 1.7 | --- | mA |
| | G1084-25 V _{IN} = 5V | --- | 2.1 | --- | |
| | G1084-33 V _{IN} = 5V | --- | 2.4 | --- | |
| Ripple Rejection | f = 120Hz, C _{OUT} = 10μF Tantalum, (V _{IN} - V _{OUT}) = 3V, I _{OUT} = 1A | --- | 50 | --- | dB |
| Thermal Shutdown | Junction Temperature | --- | 150 | --- | °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**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

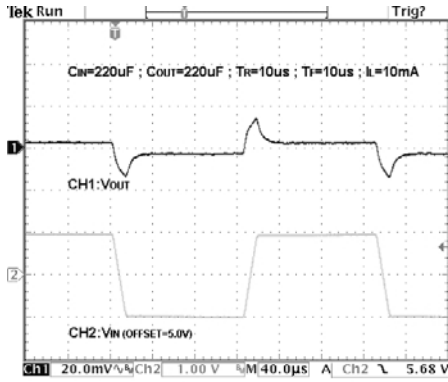
Current which is used to operate the regulator chip and is not delivered to the load.



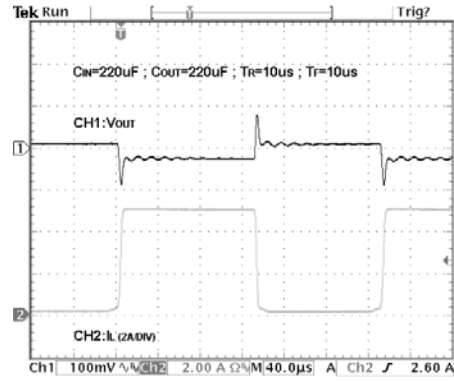
Typical Performance Characteristics

$V_{IN}-V_{OUT} = 3V$, $C_{IN} = 220\mu F$, $C_{OUT} = 220\mu F$, $T_A=25^\circ C$, unless otherwise noted.

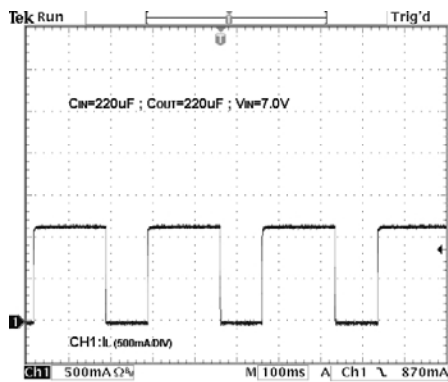
Line Transient Response



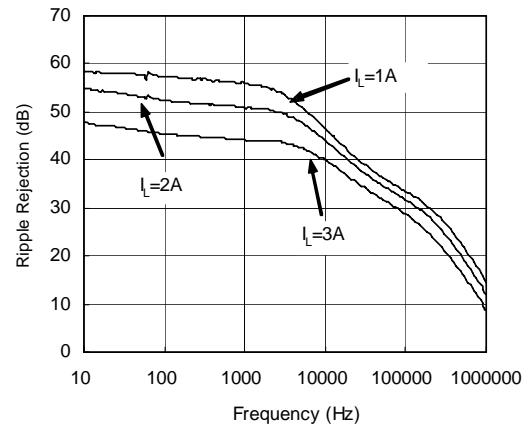
Load Transient Response



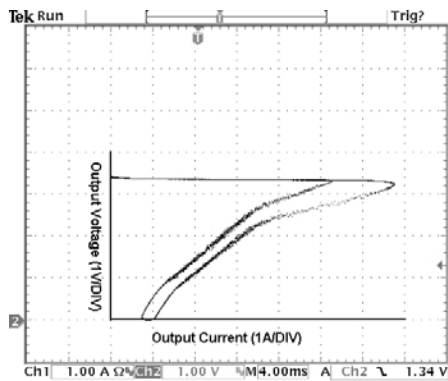
Short Circuit Current



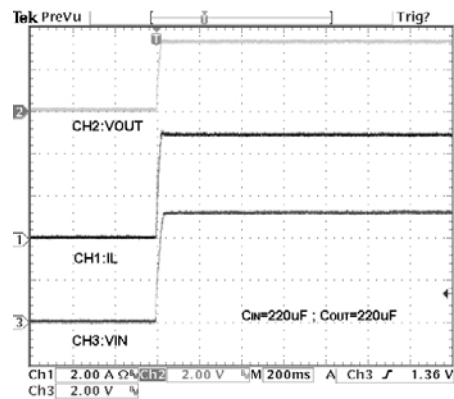
Ripple Rejection



G1084-33 Overcurrent Protection Characteristics



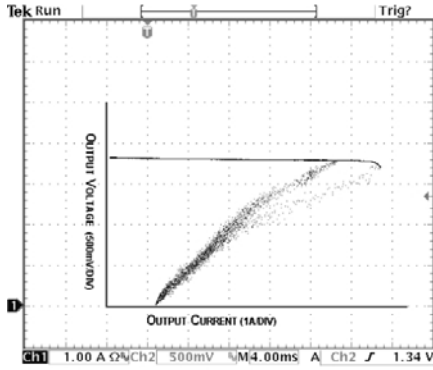
G1084 Start-up



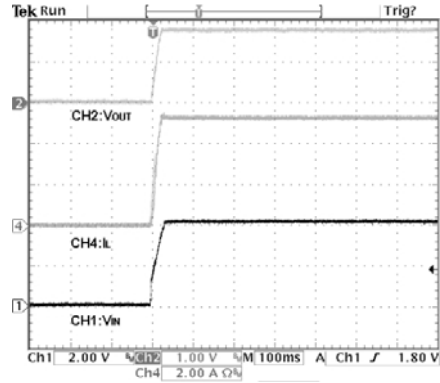


Typical Performance Characteristics (continued)

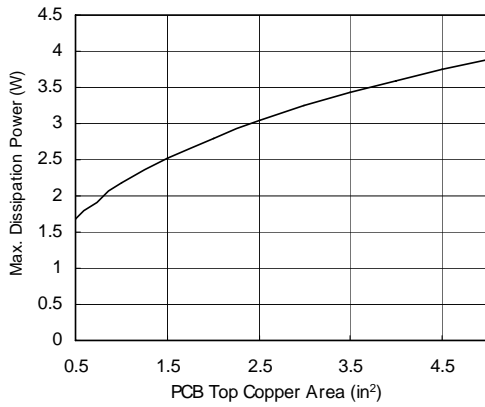
G1084-18 Overcurrent Protection Characteristics



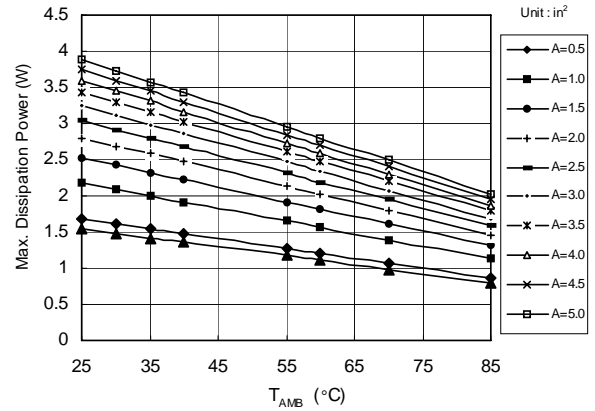
G1084-18 Start-up



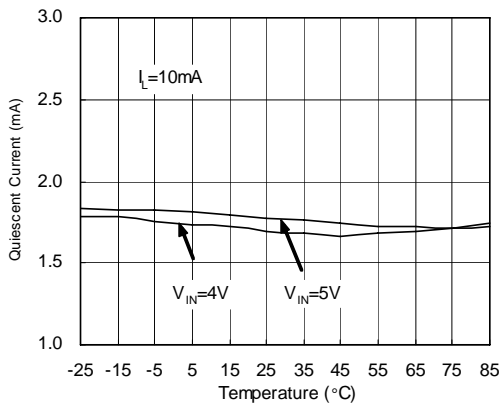
G1084 Max. Power Dissipation vs. PCB Top Copper Area



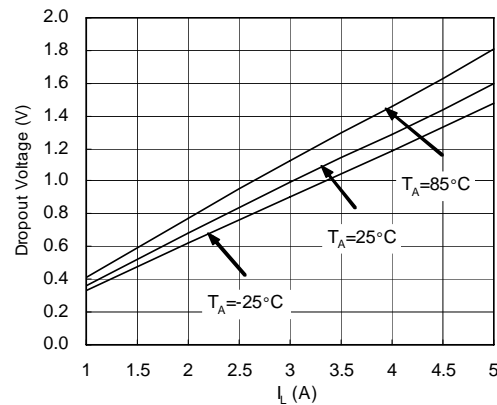
G1084 Max. Power Dissipation vs. T_{AMB}



G1084-18 Quiescent Current vs. Temperature



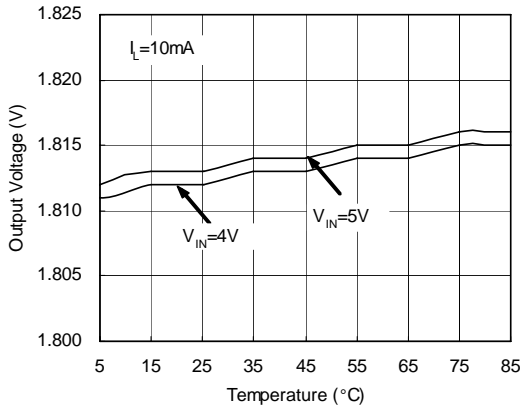
G1084-18 Dropout Voltage vs. I_L



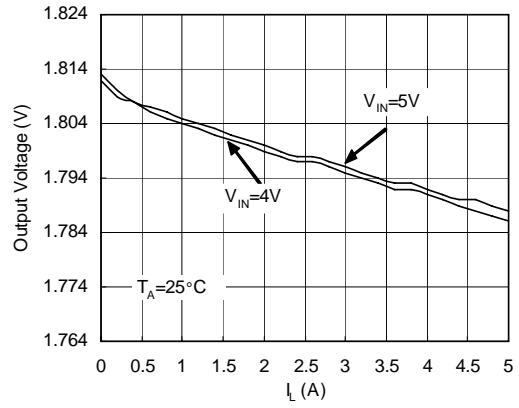


Typical Performance Characteristics (continued)

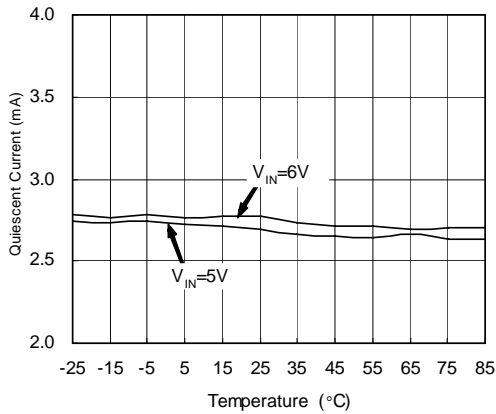
G1084-18 Output Voltage vs. Temperature



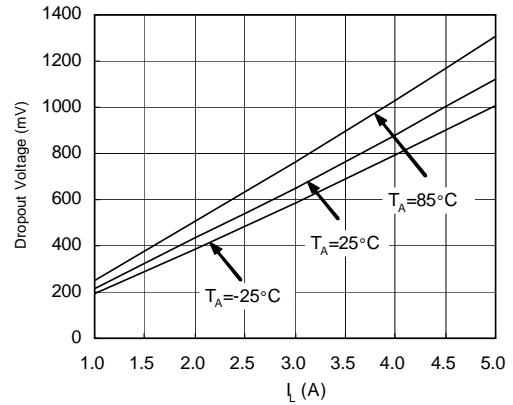
G1084-18 Output Voltage vs. I_L



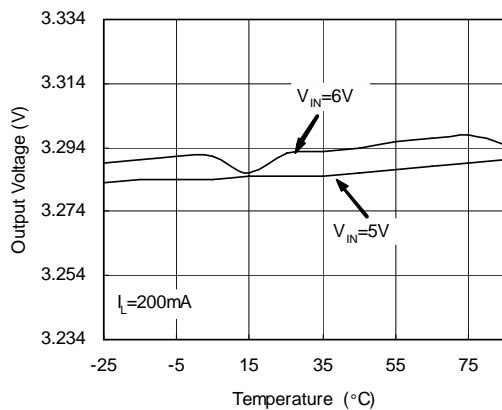
G1084-33 Quiescent Current vs. Temperature



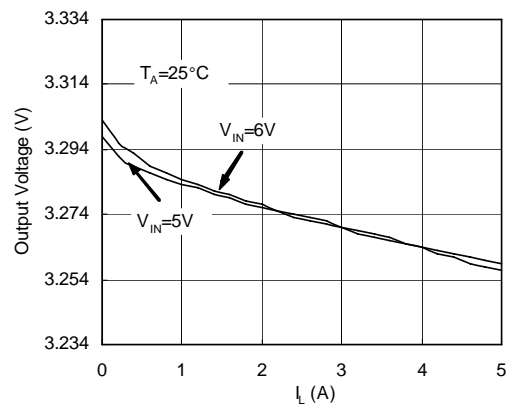
G1084-33 Dropout Voltage vs. I_L



G1084-33 Output Voltage vs. Temperature



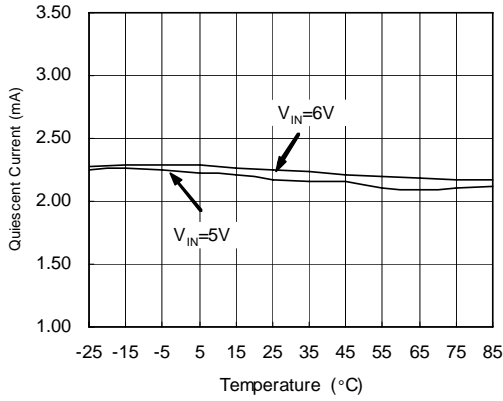
G1084-33 Output Voltage vs. I_L



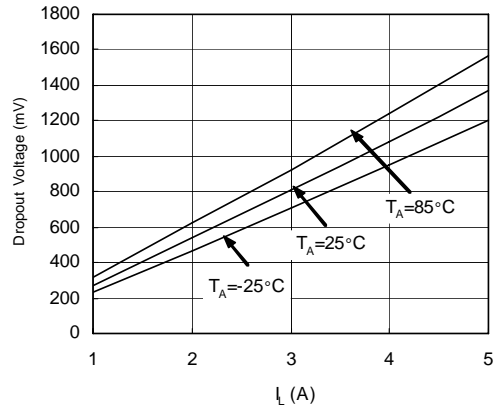


Typical Performance Characteristics (continued)

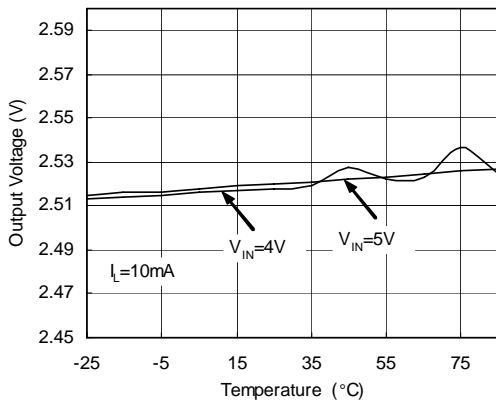
G1084-25 Quiescent Current vs. Temperature



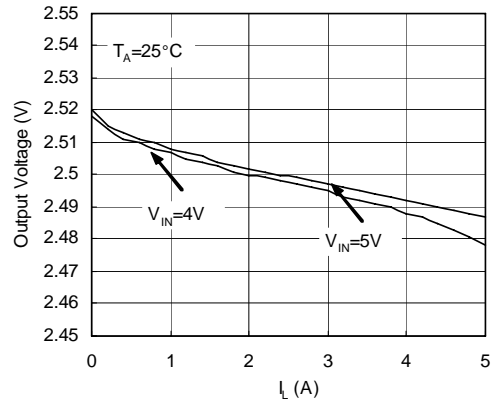
G1084-25 Dropout Voltage vs. IL



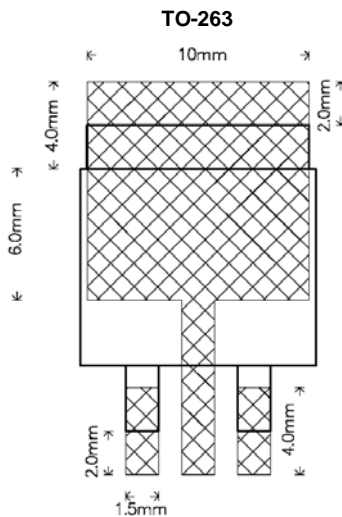
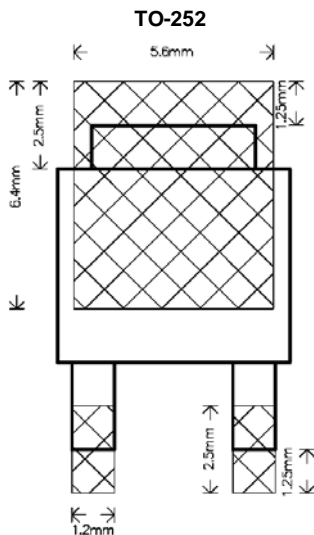
G1084-25-Output Voltage vs. Temperature



G1084-25 Output Voltage vs. IL

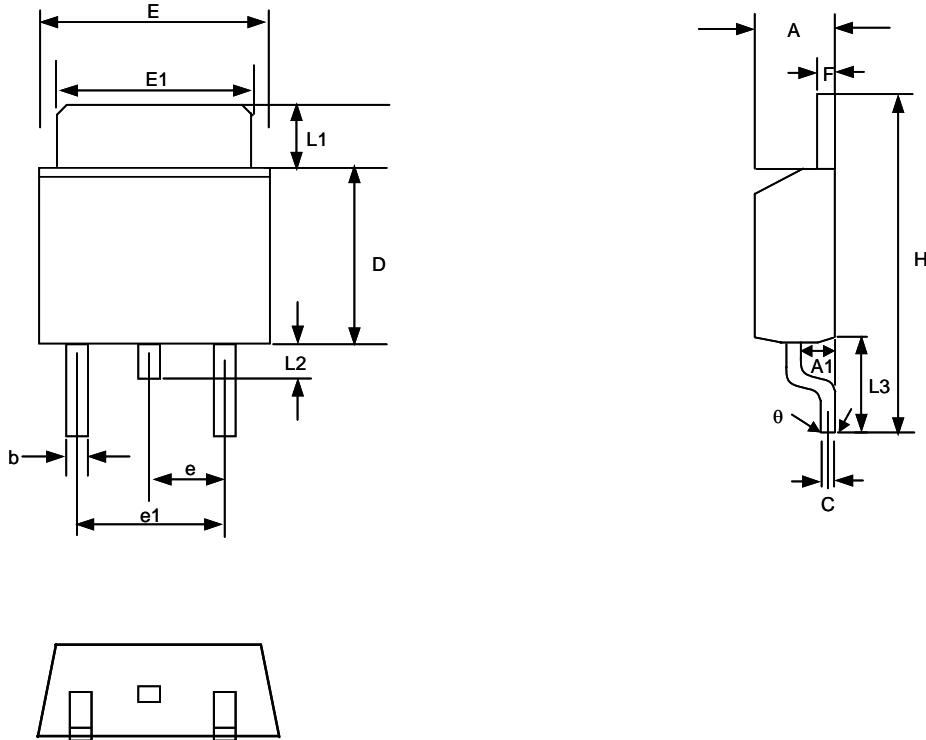


Recommend Minimum Footprint



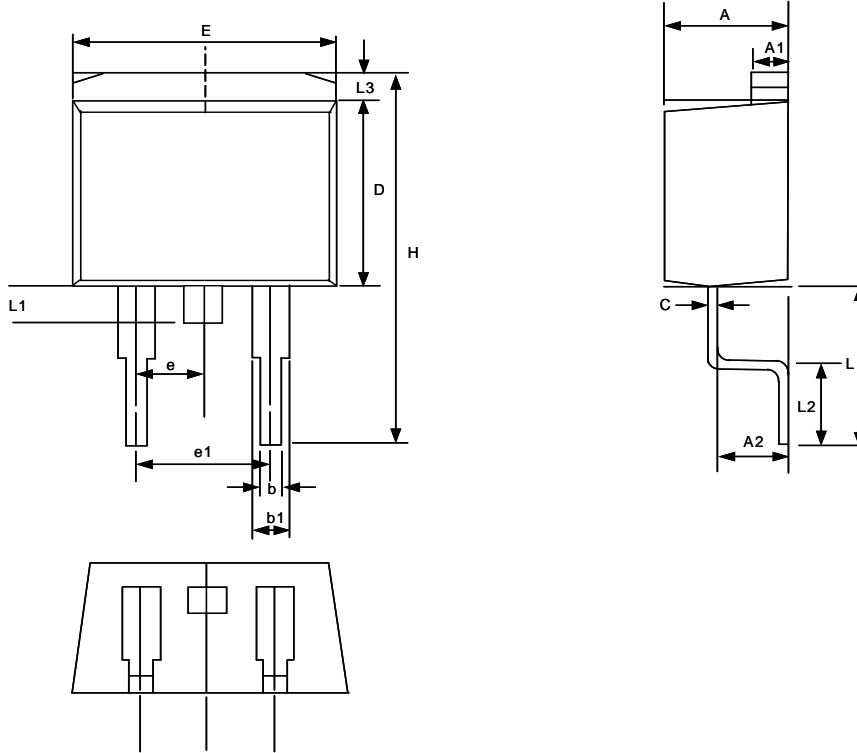


Package Information



TO-252 (T4) Package

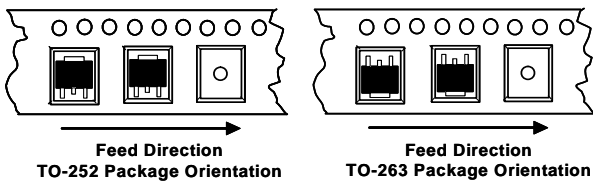
| SYMBOL | MILLIMETER | | INCH | |
|--------|------------|-------|---------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 2.19 | 2.38 | 0.086 | 0.094 |
| A1 | 0.89 | 1.27 | 0.035 | 0.050 |
| b | 0.64 | 0.89 | 0.025 | 0.035 |
| C | 0.46 | 0.58 | 0.018 | 0.023 |
| D | 5.97 | 6.22 | 0.235 | 0.245 |
| E | 6.35 | 6.73 | 0.250 | 0.265 |
| E1 | 5.21 | 5.46 | 0.205 | 0.215 |
| e | 2.26BSC | | 0.09BSC | |
| 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 | |

Taping Specification



| PACKAGE | Q'TY/REEL |
|---------|-----------|
| TO-252 | 2,500 ea |
| TO-263 | 800 ea |

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