

### Description

The GM7800 series are classic regulators, which are useful in a wide range of applications. For example, you can use them for local on-card regulation to eliminate the distribution and problems associated with single point regulation.

The wide range of output voltages (5V to 27V) make them useful in an endless list of applications. Although designed as fixed voltage regulators, you can add a few external components to make adjustable voltages and currents.

Current limiting prevents the peak output current to a safe value. Safe-area protection of the output transistor limits internal power dissipation. If internal power dissipation becomes too high for the heat sinking provided, the thermal shutdown circuit activates to prevent the regulator from overheating. These versatile workhorses are easy to use. You do not need to bypass the output, although this does improve transient response. Input bypass is needed only if you place the regulator far from the filter capacitor of the power supply.

The GM7800 series is available in TO-220, TO-252 and TO-263 packages.

### Features

- ◆ Output current up to 1.5A
- ◆ Output Voltages 5V, 6V, 8V, 8.5V, 9V, 10V, 12V, 15V, 18V, 20V, 24V and 27V
- ◆ 3- Terminal Regulators
- ◆ Internal Thermal Overload Protection
- ◆ Internal Short-Circuit Current Limiting
- ◆ Output Transistor Safe-Area Protection
- ◆ TO-220, TO-252 and TO-263 Packages
- ◆ High Power Dissipation Capability
- ◆ Direct replacements for LM78xx

### Application

Post-Regulator Switching DC/DC Converters

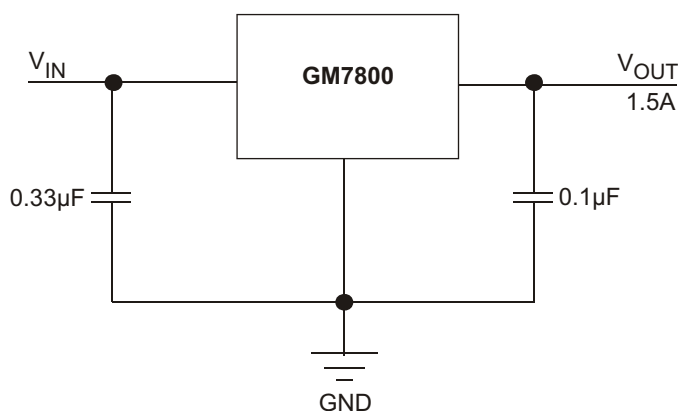
Bias Supply for Analog Circuits

Instrumentation and Audio Systems

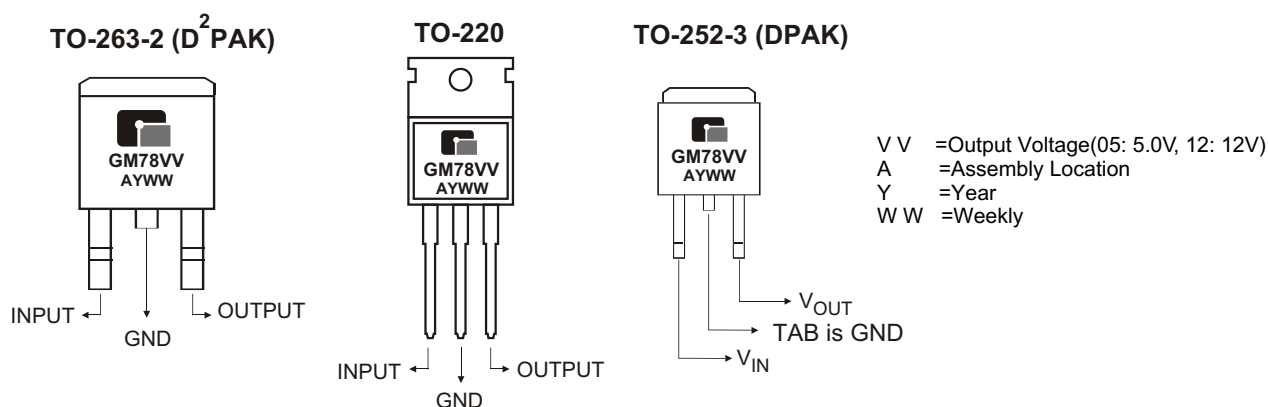
Logic Systems

Others too numerous to mention

### TYPIC APPLICATION CIRCUITS



For a positive regulator, a 0.33µF bypass capacitor should be used on the input terminals. While not necessary for stability, an output capacitor of 0.1µF may be used to improve the transient response of the regulator. These capacitors should be on or as near as possible to the regulator terminals.

**◆ MARKING INFORMATION & PIN CONFIGURATIONS (TOP VIEW)**

**◆ ORDERING INFORMATION**

| Pro Number | V <sub>OUT</sub> | Package                |
|------------|------------------|------------------------|
| GM7805     | 5.0V             | TO-263, TO-220, TO-252 |
| GM7806     | 6.0V             | TO-263, TO-220, TO-252 |
| GM7808     | 8.0V             | TO-263, TO-220, TO-252 |
| GM7885     | 8.5V             | TO-263, TO-220, TO-252 |
| GM7809     | 9.0V             | TO-263, TO-220, TO-252 |
| GM7810     | 10V              | TO-263, TO-220, TO-252 |
| GM7812     | 12V              | TO-263, TO-220, TO-252 |
| GM7815     | 15V              | TO-263, TO-220, TO-252 |
| GM7818     | 18V              | TO-263, TO-220, TO-252 |
| GM7820     | 20V              | TO-263, TO-220, TO-252 |
| GM7824     | 24V              | TO-263, TO-220, TO-252 |
| GM7827     | 27V              | TO-263, TO-220, TO-252 |

\* For detail Ordering Number identification, please see last page.

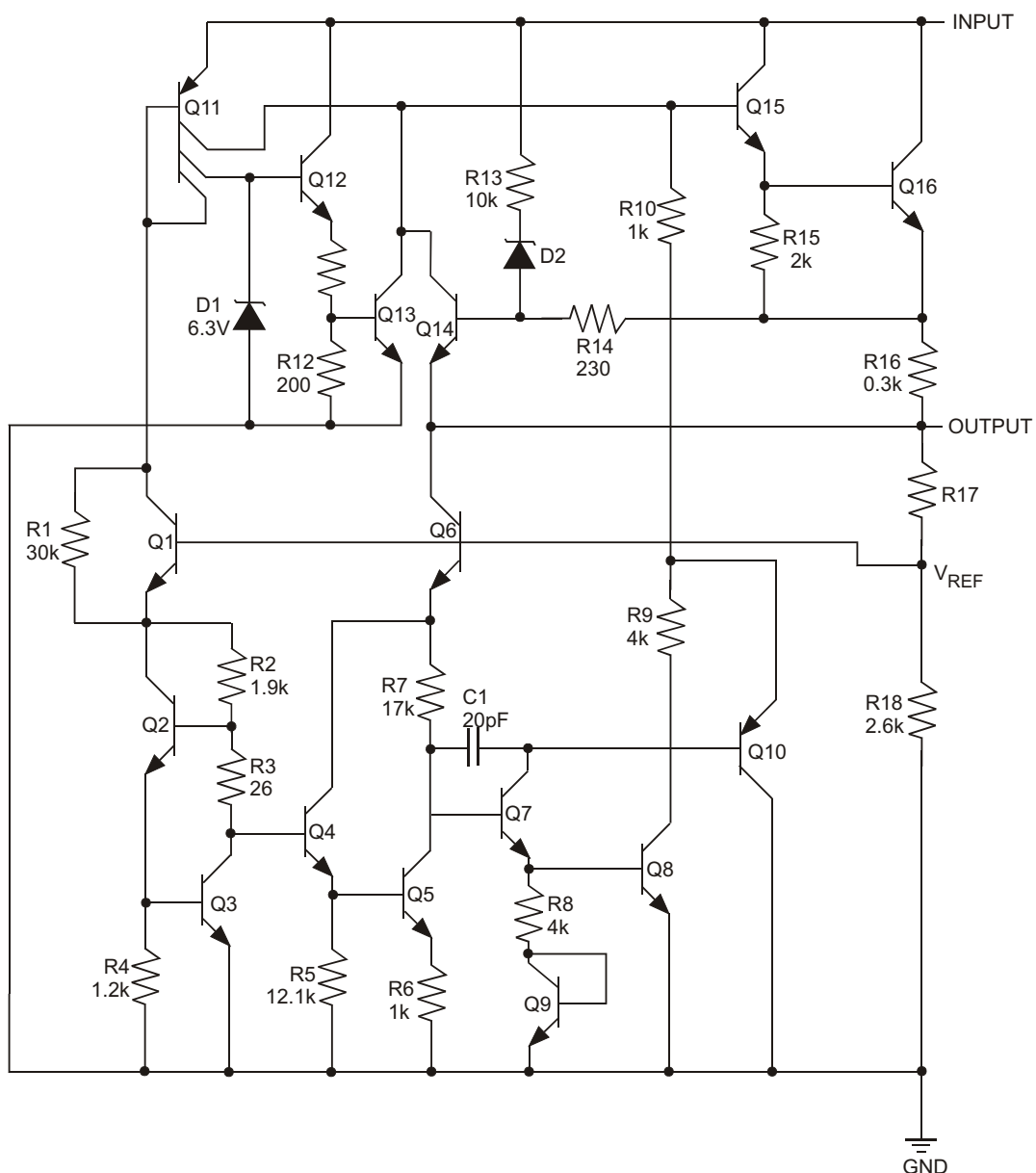
**◆ RECOMMENDED OPERATING CONDITIONS (I<sub>O</sub>= 1.5A)**

| PARAMETER                                              |        | MIN  | MAX | UNIT |
|--------------------------------------------------------|--------|------|-----|------|
| Input Voltage V <sub>I</sub>                           | GM7805 | 7    | 25  | V    |
|                                                        | GM7806 | 8    | 25  |      |
|                                                        | GM7808 | 10.5 | 25  |      |
|                                                        | GM7885 | 10.5 | 25  |      |
|                                                        | GM7809 | 11.5 | 27  |      |
|                                                        | GM7810 | 12.5 | 28  |      |
|                                                        | GM7812 | 14.5 | 30  |      |
|                                                        | GM7815 | 17.5 | 30  |      |
|                                                        | GM7818 | 21   | 33  |      |
|                                                        | GM7820 | 23   | 36  |      |
|                                                        | GM7824 | 27   | 38  |      |
|                                                        | GM7827 | 30   | 40  |      |
| Output Current, I <sub>O</sub>                         |        |      | 1.5 | A    |
| Operating virtual junction temperature, T <sub>J</sub> |        | 0    | 125 | °C   |

### ◆ ABSOLUTE MAXIMUM RATINGS

| PARAMETER                                                        |                | VALUE       | UNIT |
|------------------------------------------------------------------|----------------|-------------|------|
| Input Voltage                                                    | GM7824, GM7827 | 40          | V    |
|                                                                  | All others     | 35          |      |
| Continuous Total Dissipation at 25°C free-air temperature        |                | 2           | W    |
| Continuous Total Dissipation at (or below) 25°C case Temperature |                | 15          |      |
| Operating free-air, case, or virtual junctions Temperature Range |                | 0 to +150   | °C   |
| Storage Temperature Range                                        |                | -65 to +150 |      |
| Lead Temperature 1.6mm (1/16 inch) from case for 10seconds       |                | 260         |      |

### ◆ SCHEMATIC BLOCK DIAGRAM



## ◆ ELECTRICAL CHARACTERISTICS at specified Junction Temperature

**GM7805:**  $V_I = 10V$ ,  $I_O = 500mA$ , (unless otherwise noted)

| CHARACTERISTICS                        | TEST CONDITIONS *                                    |              | MIN  | TYP   | MAX  | UNIT  |
|----------------------------------------|------------------------------------------------------|--------------|------|-------|------|-------|
| Output Voltage **                      |                                                      | 25°C         | 4.8  | 5.0   | 5.2  | V     |
|                                        | $I_O = 5mA$ to 1A<br>$V_I = 7V$ to 20V, $P \leq 15W$ | 0°C to 125°C | 4.75 | 5.0   | 5.25 |       |
| Input Regulation                       | $V_I = 7V$ to 25V                                    | 25°C         |      | 3     | 100  | mV    |
|                                        | $V_I = 8V$ to 12V                                    |              |      | 1     | 50   |       |
| Ripple Rejection                       | $V_I = 8V$ to 18V, $f = 120Hz$                       | 0°C to 125°C | 62   | 78    |      | dB    |
| Output Regulation                      | $I_O = 5mA$ to 1.5A                                  | 25°C         |      | 15    | 100  | mV    |
|                                        | $I_O = 250mA$ to 750mA                               |              |      | 5     | 50   |       |
| Output Resistance                      | $f = 1kHz$                                           | 0°C to 125°C |      | 0.017 |      |       |
| Temperature Coefficient Output Voltage | $I_O = 5mA$                                          | 0°C to 125°C |      | -1.1  |      | mV/°C |
| Output Noise Voltage                   | $f = 10Hz$ to 100kHz                                 | 25°C         |      | 40    |      | µV    |
| Dropout Voltage                        | $I_O = 1A$                                           | 25°C         |      | 2.0   |      | V     |
| Bias Current                           |                                                      | 25°C         |      | 4.2   | 8    | mA    |
| Bias Current Change                    | $V_I = 7V$ to 25V                                    | 0°C to 125°C |      |       | 1.3  | mA    |
|                                        | $I_O = 5mA$ to 1A                                    |              |      |       | 0.5  |       |
| Short-Circuit Output Current           |                                                      | 25°C         |      | 750   |      | mA    |
| Peak Output Current                    |                                                      | 25°C         |      | 2.2   |      | A     |

**GM7806:**  $V_I = 11V$ ,  $I_O = 500mA$ , (unless otherwise noted)

| CHARACTERISTICS                        | TEST CONDITIONS *                                    |              | MIN  | TYP   | MAX  | UNIT  |
|----------------------------------------|------------------------------------------------------|--------------|------|-------|------|-------|
| Output Voltage **                      |                                                      | 25°C         | 5.75 | 6     | 6.25 | V     |
|                                        | $I_O = 5mA$ to 1A<br>$V_I = 8V$ to 21V, $P \leq 15W$ | 0°C to 125°C | 5.7  | 6     | 6.3  |       |
| Input Regulation                       | $V_I = 8V$ to 25V                                    | 25°C         |      | 5     | 120  | mV    |
|                                        | $V_I = 9V$ to 13V                                    |              |      | 1.5   | 60   |       |
| Ripple Rejection                       | $V_I = 9V$ to 19V, $f = 120Hz$                       | 0°C to 125°C | 59   | 75    |      | dB    |
| Output Regulation                      | $I_O = 5mA$ to 1.5A                                  | 25°C         |      | 14    | 120  | mV    |
|                                        | $I_O = 250mA$ to 750mA                               |              |      | 4     | 60   |       |
| Output Resistance                      | $f = 1kHz$                                           | 0°C to 125°C |      | 0.019 |      |       |
| Temperature Coefficient Output Voltage | $I_O = 5mA$                                          | 0°C to 125°C |      | -0.8  |      | mV/°C |
| Output Noise Voltage                   | $f = 10Hz$ to 100kHz                                 | 25°C         |      | 45    |      | µV    |
| Dropout Voltage                        | $I_O = 1A$                                           | 25°C         |      | 2.0   |      | V     |
| Bias Current                           |                                                      | 25°C         |      | 4.3   | 8    | mA    |
| Bias Current Change                    | $V_I = 8V$ to 25V                                    | 0°C to 125°C |      |       | 1.3  | mA    |
|                                        | $I_O = 5mA$ to 1A                                    |              |      |       | 0.5  |       |
| Short-Circuit Output Current           |                                                      | 25°C         |      | 550   |      | mA    |
| Peak Output Current                    |                                                      | 25°C         |      | 2.2   |      | A     |

\*Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account.

\*\* The specification applies only for DC power dissipation permitted by absolute maximum ratings

**◆ ELECTRICAL CHARACTERISTICS at specified Junction Temperature**
**GM7808:**  $V_I=14V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                        | TEST CONDITIONS *                                                  |              | MIN | TYP   | MAX | UNIT  |
|----------------------------------------|--------------------------------------------------------------------|--------------|-----|-------|-----|-------|
| Output Voltage **                      |                                                                    | 25°C         | 7.7 | 8     | 8.3 | V     |
|                                        | I <sub>O</sub> = 5mA to 1A<br>V <sub>I</sub> =10.5V to 23V, P≤ 15W | 0°C to 125°C | 7.6 | 8     | 8.4 |       |
| Input Regulation                       | V <sub>I</sub> =10.5V to 25V                                       | 25°C         |     | 6     | 160 | mV    |
|                                        | V <sub>I</sub> =11V to 17V                                         |              |     | 2     | 80  |       |
| Ripple Rejection                       | V <sub>I</sub> =11.5V to 21.5V, f = 120Hz                          | 0°C to 125°C | 55  | 72    |     | dB    |
| Output Regulation                      | I <sub>O</sub> =5mA to 1.5A                                        | 25°C         |     | 12    | 160 | mV    |
|                                        | I <sub>O</sub> =250mA to 750mA                                     |              |     | 4     | 80  |       |
| Output Resistance                      | f = 1kHz                                                           | 0°C to 125°C |     | 0.016 |     |       |
| Temperature Coefficient Output Voltage | I <sub>O</sub> = 5mA                                               | 0°C to 125°C |     | -0.8  |     | mV/°C |
| Output Noise Voltage                   | f = 10Hz to 100kHz                                                 | 25°C         |     | 52    |     | µV    |
| Dropout Voltage                        | I <sub>O</sub> = 1A                                                | 25°C         |     | 2.0   |     | V     |
| Bias Current                           |                                                                    | 25°C         |     | 4.3   | 8   | mA    |
| Bias Current Change                    | V <sub>I</sub> = 10.5V to 25V                                      | 0°C to 125°C |     |       | 1.0 | mA    |
|                                        | I <sub>O</sub> =5mA to 1A                                          |              |     |       | 0.5 |       |
| Short-Circuit Output Current           |                                                                    | 25°C         |     | 450   |     | mA    |
| Peak Output Current                    |                                                                    | 25°C         |     | 2.2   |     | A     |

**GM7885:**  $V_I=15V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                           | TEST CONDITIONS *                                                     |              | MIN  | TYP   | MAX  | UNIT  |
|-------------------------------------------|-----------------------------------------------------------------------|--------------|------|-------|------|-------|
| Output Voltage **                         |                                                                       | 25°C         | 8.15 | 8.5   | 8.85 | V     |
|                                           | I <sub>O</sub> = 5mA to 1A<br>V <sub>I</sub> =11.5V to 23.5V, P ≤ 15W | 0°C to 125°C | 8.1  | 8.5   | 8.9  |       |
| Input Regulation                          | V <sub>I</sub> =10.5V to 25V                                          | 25°C         |      | 6     | 170  | mV    |
|                                           | V <sub>I</sub> =11V to 17V                                            |              |      | 2     | 85   |       |
| Ripple Rejection                          | V <sub>I</sub> =11.5V to 21.5V, f = 120Hz                             | 0°C to 125°C | 54   | 70    |      | dB    |
| Output Regulation                         | I <sub>O</sub> =5mA to 1.5A                                           | 25°C         |      | 12    | 170  | mV    |
|                                           | I <sub>O</sub> =250mA to 750mA                                        |              |      | 4     | 85   |       |
| Output Resistance                         | f = 1kHz                                                              | 0°C to 125°C |      | 0.016 |      |       |
| Temperature Coefficient<br>Output Voltage | I <sub>O</sub> = 5mA                                                  | 0°C to 125°C |      | -0.8  |      | mV/°C |
| Output Noise Voltage                      | f = 10Hz to 100kHz                                                    | 25°C         |      | 55    |      | µV    |
| Dropout Voltage                           | I <sub>O</sub> = 1A                                                   | 25°C         |      | 2.0   |      | V     |
| Bias Current                              |                                                                       | 25°C         |      | 4.3   | 8    | mA    |
| Bias Current Change                       | V <sub>I</sub> = 10.5V to 25V                                         | 0°C to 125°C |      |       | 1.0  | mA    |
|                                           | I <sub>O</sub> =5mA to 1A                                             |              |      |       | 0.5  |       |
| Short-Circuit Output Current              |                                                                       | 25°C         |      | 450   |      | mA    |
| Peak Output Current                       |                                                                       | 25°C         |      | 2.2   |      | A     |

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#### ◆ ELECTRICAL CHARACTERISTICS at specified Junction Temperature

**GM7809:**  $V_I=16V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                        | TEST CONDITIONS *                                   |              | MIN  | TYP   | MAX  | UNIT  |
|----------------------------------------|-----------------------------------------------------|--------------|------|-------|------|-------|
| Output Voltage **                      |                                                     | 25°C         | 8.65 | 9     | 9.35 | V     |
|                                        | $I_O=5mA$ to 1A<br>$V_I=11.5V$ to 24V, $P \leq 15W$ | 0°C to 125°C | 8.55 | 9     | 9.45 |       |
| Input Regulation                       | $V_I=11.5V$ to 27V                                  | 25°C         |      | 7     | 180  | mV    |
|                                        | $V_I=13V$ to 19V                                    |              |      | 2     | 90   |       |
| Ripple Rejection                       | $V_I=12V$ to 22V, $f = 120Hz$                       | 0°C to 125°C | 55   | 70    |      | dB    |
| Output Regulation                      | $I_O=5mA$ to 1.5A                                   | 25°C         |      | 12    | 180  | mV    |
|                                        | $I_O=250mA$ to 750mA                                |              |      | 4     | 90   |       |
| Output Resistance                      | $f = 1kHz$                                          | 0°C to 125°C |      | 0.018 |      |       |
| Temperature Coefficient Output Voltage | $I_O=5mA$                                           | 0°C to 125°C |      | -1.0  |      | mV/°C |
| Output Noise Voltage                   | $f = 10Hz$ to 100kHz                                | 25°C         |      | 60    |      | μV    |
| Dropout Voltage                        | $I_O=1A$                                            | 25°C         |      | 2.0   |      | V     |
| Bias Current                           |                                                     | 25°C         |      | 4.3   | 8    | mA    |
| Bias Current Change                    | $V_I=11.5V$ to 27V                                  | 0°C to 125°C |      |       | 1.0  | mA    |
|                                        | $I_O=5mA$ to 1A                                     |              |      |       | 0.5  |       |
| Short-Circuit Output Current           |                                                     | 25°C         |      | 400   |      | mA    |
| Peak Output Current                    |                                                     | 25°C         |      | 2.2   |      | A     |

**GM7810:**  $V_I=17V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                        | TEST CONDITIONS *                                   |              | MIN | TYP   | MAX  | UNIT  |
|----------------------------------------|-----------------------------------------------------|--------------|-----|-------|------|-------|
| Output Voltage **                      |                                                     | 25°C         | 9.6 | 10    | 10.4 | V     |
|                                        | $I_O=5mA$ to 1A<br>$V_I=12.5V$ to 25V, $P \leq 15W$ | 0°C to 125°C | 9.5 | 10    | 10.5 |       |
| Input Regulation                       | $V_I=12.5V$ to 28V                                  | 25°C         |     | 7     | 200  | mV    |
|                                        | $V_I=14V$ to 20V                                    |              |     | 2     | 100  |       |
| Ripple Rejection                       | $V_I=13V$ to 23V, $f = 120Hz$                       | 0°C to 125°C | 55  | 71    |      | dB    |
| Output Regulation                      | $I_O=5mA$ to 1.5A                                   | 25°C         |     | 12    | 200  | mV    |
|                                        | $I_O=250mA$ to 750mA                                |              |     | 4     | 100  |       |
| Output Resistance                      | $f = 1kHz$                                          | 0°C to 125°C |     | 0.018 |      |       |
| Temperature Coefficient Output Voltage | $I_O=5mA$                                           | 0°C to 125°C |     | -1.0  |      | mV/°C |
| Output Noise Voltage                   | $f = 10Hz$ to 100kHz                                | 25°C         |     | 70    |      | μV    |
| Dropout Voltage                        | $I_O=1A$                                            | 25°C         |     | 2.0   |      | V     |
| Bias Current                           |                                                     | 25°C         |     | 4.3   | 8    | mA    |
| Bias Current Change                    | $V_I=12.5V$ to 28V                                  | 0°C to 125°C |     |       | 1.0  | mA    |
|                                        | $I_O=5mA$ to 1A                                     |              |     |       | 0.5  |       |
| Short-Circuit Output Current           |                                                     | 25°C         |     | 400   |      | mA    |
| Peak Output Current                    |                                                     | 25°C         |     | 2.2   |      | A     |

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## ◆ ELECTRICAL CHARACTERISTICS at specified Junction Temperature

**GM7812:**  $V_I=19V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                           | TEST CONDITIONS *                                                   |              | MIN  | TYP   | MAX  | UNIT  |
|-------------------------------------------|---------------------------------------------------------------------|--------------|------|-------|------|-------|
| Output Voltage **                         |                                                                     | 25°C         | 11.5 | 12    | 12.5 | V     |
|                                           | I <sub>O</sub> = 5mA to 1A<br>V <sub>I</sub> =14.5V to 27V, P ≤ 15W | 0°C to 125°C | 11.4 | 12    | 12.6 |       |
| Input Regulation                          | V <sub>I</sub> =14.5V to 30V                                        | 25°C         |      | 10    | 240  | mV    |
|                                           | V <sub>I</sub> =16V to 22V                                          |              |      | 3     | 120  |       |
| Ripple Rejection                          | V <sub>I</sub> =15V to 25V, f = 120Hz                               | 0°C to 125°C | 55   | 71    |      | dB    |
| Output Regulation                         | I <sub>O</sub> =5mA to 1.5A                                         | 25°C         |      | 12    | 240  | mV    |
|                                           | I <sub>O</sub> =250mA to 750mA                                      |              |      | 4     | 120  |       |
| Output Resistance                         | f = 1kHz                                                            | 0°C to 125°C |      | 0.018 |      |       |
| Temperature Coefficient<br>Output Voltage | I <sub>O</sub> = 5mA                                                | 0°C to 125°C |      | -1.0  |      | mV/°C |
| Output Noise Voltage                      | f = 10Hz to 100kHz                                                  | 25°C         |      | 75    |      | μV    |
| Dropout Voltage                           | I <sub>O</sub> = 1A                                                 | 25°C         |      | 2.0   |      | V     |
| Bias Current                              |                                                                     | 25°C         |      | 4.3   | 8    | mA    |
| Bias Current Change                       | V <sub>I</sub> = 14.5V to 30V                                       | 0°C to 125°C |      |       | 1.0  | mA    |
|                                           | I <sub>O</sub> =5mA to 1A                                           |              |      |       | 0.5  |       |
| Short-Circuit Output Current              |                                                                     | 25°C         |      | 350   |      | mA    |
| Peak Output Current                       |                                                                     | 25°C         |      | 2.2   |      | A     |

**GM7815:**  $V_I=23V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                           | TEST CONDITIONS *                                                   |              | MIN   | TYP   | MAX   | UNIT  |
|-------------------------------------------|---------------------------------------------------------------------|--------------|-------|-------|-------|-------|
| Output Voltage **                         |                                                                     | 25°C         | 14.4  | 15    | 15.6  | V     |
|                                           | I <sub>O</sub> = 5mA to 1A<br>V <sub>I</sub> =17.5V to 30V, P ≤ 15W | 0°C to 125°C | 14.25 | 15    | 15.75 |       |
| Input Regulation                          | V <sub>I</sub> =17.5V to 30V                                        | 25°C         |       | 12    | 300   | mV    |
|                                           | V <sub>I</sub> =20V to 26V                                          |              |       | 3     | 150   |       |
| Ripple Rejection                          | V <sub>I</sub> =18.5V to 28.5V, f = 120Hz                           | 0°C to 125°C | 54    | 70    |       | dB    |
| Output Regulation                         | I <sub>O</sub> =5mA to 1.5A                                         | 25°C         |       | 12    | 300   | mV    |
|                                           | I <sub>O</sub> =250mA to 750mA                                      |              |       | 4     | 150   |       |
| Output Resistance                         | f = 1kHz                                                            | 0°C to 125°C |       | 0.019 |       |       |
| Temperature Coefficient<br>Output Voltage | I <sub>O</sub> = 5mA                                                | 0°C to 125°C |       | -1.0  |       | mV/°C |
| Output Noise Voltage                      | f = 10Hz to 100kHz                                                  | 25°C         |       | 90    |       | μV    |
| Dropout Voltage                           | I <sub>O</sub> = 1A                                                 | 25°C         |       | 2.0   |       | V     |
| Bias Current                              |                                                                     | 25°C         |       | 4.3   | 8     | mA    |
| Bias Current Change                       | V <sub>I</sub> = 17.5V to 30V                                       | 0°C to 125°C |       |       | 1.0   | mA    |
|                                           | I <sub>O</sub> =5mA to 1A                                           |              |       |       | 0.5   |       |
| Short-Circuit Output Current              |                                                                     | 25°C         |       | 230   |       | mA    |
| Peak Output Current                       |                                                                     | 25°C         |       | 2.1   |       | A     |

\*Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account.

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#### ◆ ELECTRICAL CHARACTERISTICS at specified Junction Temperature

**GM7818:**  $V_I=27V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                        | TEST CONDITIONS *                                 |              | MIN  | TYP   | MAX  | UNIT  |
|----------------------------------------|---------------------------------------------------|--------------|------|-------|------|-------|
| Output Voltage **                      |                                                   | 25°C         | 17.3 | 18    | 18.7 | V     |
|                                        | $I_O=5mA$ to 1A<br>$V_I=21V$ to 33V, $P \leq 15W$ | 0°C to 125°C | 17.1 | 18    | 18.9 |       |
| Input Regulation                       | $V_I=21V$ to 33V                                  | 25°C         |      | 15    | 360  | mV    |
|                                        | $V_I=24V$ to 30V                                  |              |      | 5     | 180  |       |
| Ripple Rejection                       | $V_I=22V$ to 32V, $f = 120Hz$                     | 0°C to 125°C | 53   | 69    |      | dB    |
| Output Regulation                      | $I_O=5mA$ to 1.5A                                 | 25°C         |      | 12    | 360  | mV    |
|                                        | $I_O=250mA$ to 750mA                              |              |      | 4     | 180  |       |
| Output Resistance                      | $f = 1kHz$                                        | 0°C to 125°C |      | 0.022 |      |       |
| Temperature Coefficient Output Voltage | $I_O=5mA$                                         | 0°C to 125°C |      | -1.0  |      | mV/°C |
| Output Noise Voltage                   | $f = 10Hz$ to 100kHz                              | 25°C         |      | 110   |      | μV    |
| Dropout Voltage                        | $I_O=1A$                                          | 25°C         |      | 2.0   |      | V     |
| Bias Current                           |                                                   | 25°C         |      | 4.5   | 8    | mA    |
| Bias Current Change                    | $V_I=21V$ to 33V                                  | 0°C to 125°C |      |       | 1.0  | mA    |
|                                        | $I_O=5mA$ to 1A                                   |              |      |       | 0.5  |       |
| Short-Circuit Output Current           |                                                   | 25°C         |      | 200   |      | mA    |
| Peak Output Current                    |                                                   | 25°C         |      | 2.1   |      | A     |

**GM7820:**  $V_I=29V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                        | TEST CONDITIONS *                                 |              | MIN  | TYP   | MAX  | UNIT  |
|----------------------------------------|---------------------------------------------------|--------------|------|-------|------|-------|
| Output Voltage **                      |                                                   | 25°C         | 19.2 | 20    | 20.8 | V     |
|                                        | $I_O=5mA$ to 1A<br>$V_I=23V$ to 35V, $P \leq 15W$ | 0°C to 125°C | 19   | 20    | 21   |       |
| Input Regulation                       | $V_I=23V$ to 35V                                  | 25°C         |      | 18    | 400  | mV    |
|                                        | $V_I=26V$ to 32V                                  |              |      | 7     | 200  |       |
| Ripple Rejection                       | $V_I=24V$ to 34V, $f = 120Hz$                     | 0°C to 125°C | 51   | 66    |      | dB    |
| Output Regulation                      | $I_O=5mA$ to 1.5A                                 | 25°C         |      | 15    | 400  | mV    |
|                                        | $I_O=250mA$ to 750mA                              |              |      | 7     | 200  |       |
| Output Resistance                      | $f = 1kHz$                                        | 0°C to 125°C |      | 0.027 |      |       |
| Temperature Coefficient Output Voltage | $I_O=5mA$                                         | 0°C to 125°C |      | -1.3  |      | mV/°C |
| Output Noise Voltage                   | $f = 10Hz$ to 100kHz                              | 25°C         |      | 150   |      | μV    |
| Dropout Voltage                        | $I_O=1A$                                          | 25°C         |      | 2.0   |      | V     |
| Bias Current                           |                                                   | 25°C         |      | 4.5   | 8    | mA    |
| Bias Current Change                    | $V_I=23V$ to 35V                                  | 0°C to 125°C |      |       | 1.0  | mA    |
|                                        | $I_O=5mA$ to 1A                                   |              |      |       | 0.5  |       |
| Short-Circuit Output Current           |                                                   | 25°C         |      | 180   |      | mA    |
| Peak Output Current                    |                                                   | 25°C         |      | 2.1   |      | A     |

\*Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account.

\*\* The specification applies only for DC power dissipation permitted by absolute maximum ratings



#### ◆ ELECTRICAL CHARACTERISTICS at specified Junction Temperature

**GM7824:**  $V_I=33V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                        | TEST CONDITIONS *                                        | MIN          | TYP  | MAX   | UNIT  |
|----------------------------------------|----------------------------------------------------------|--------------|------|-------|-------|
| Output Voltage **                      | $I_O = 5mA$ to $1A$<br>$V_I=27V$ to $38V$ , $P \leq 15W$ | 25°C         | 23   | 24    | 25    |
|                                        |                                                          | 0°C to 125°C | 22.8 | 24    | 25.2  |
| Input Regulation                       | $V_I=27V$ to $38V$                                       | 25°C         |      | 18    | 480   |
|                                        | $V_I=30V$ to $36V$                                       |              |      | 6     | 240   |
| Ripple Rejection                       | $V_I=28V$ to $32V$ , $f = 120Hz$                         | 0°C to 125°C | 50   | 66    |       |
| Output Regulation                      | $I_O=5mA$ to $1.5A$                                      | 25°C         |      | 12    | 480   |
|                                        | $I_O=250mA$ to $750mA$                                   |              |      | 4     | 240   |
| Output Resistance                      | $f = 1kHz$                                               | 0°C to 125°C |      | 0.028 |       |
| Temperature Coefficient Output Voltage | $I_O = 5mA$                                              | 0°C to 125°C |      | -1.5  | mV/°C |
| Output Noise Voltage                   | $f = 10Hz$ to $100kHz$                                   | 25°C         |      | 170   | µV    |
| Dropout Voltage                        | $I_O = 1A$                                               | 25°C         |      | 2.0   | V     |
| Bias Current                           |                                                          | 25°C         |      | 4.6   | 8     |
| Bias Current Change                    | $V_I = 27V$ to $38V$                                     | 0°C to 125°C |      |       | 1.0   |
|                                        | $I_O=5mA$ to $1A$                                        |              |      |       | 0.5   |
| Short-Circuit Output Current           |                                                          | 25°C         |      | 150   | mA    |
| Peak Output Current                    |                                                          | 25°C         |      | 2.1   | A     |

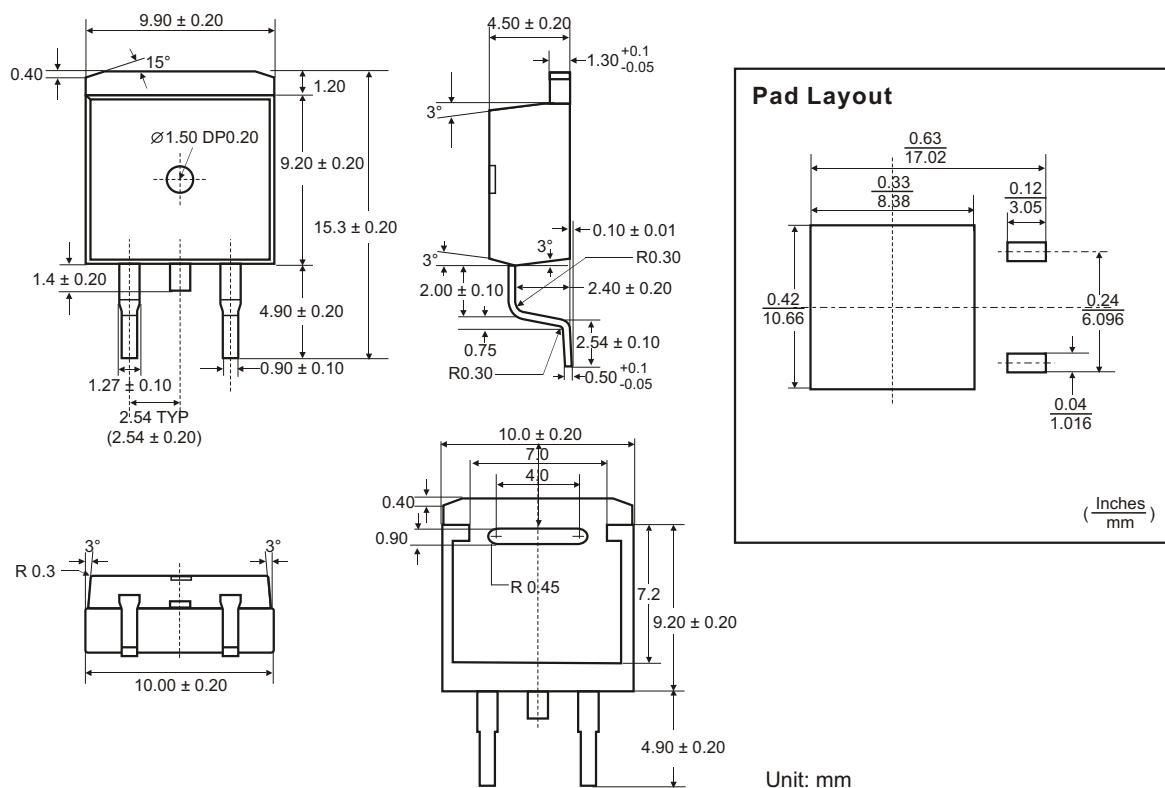
**GM7827:**  $V_I=36V$ ,  $I_O=500mA$ , (unless otherwise noted)

| CHARACTERISTICS                        | TEST CONDITIONS *                                        | MIN          | TYP  | MAX   | UNIT  |
|----------------------------------------|----------------------------------------------------------|--------------|------|-------|-------|
| Output Voltage **                      | $I_O = 5mA$ to $1A$<br>$V_I=30V$ to $40V$ , $P \leq 15W$ | 25°C         | 25.9 | 27    | 28.1  |
|                                        |                                                          | 0°C to 125°C | 25.7 | 27    | 28.3  |
| Input Regulation                       | $V_I=30V$ to $40V$                                       | 25°C         |      | 25    | 540   |
|                                        | $V_I=33V$ to $39V$                                       |              |      | 10    | 270   |
| Ripple Rejection                       | $V_I=30V$ to $40V$ , $f = 120Hz$                         | 0°C to 125°C | 50   | 64    |       |
| Output Regulation                      | $I_O=5mA$ to $1.5A$                                      | 25°C         |      | 20    | 540   |
|                                        | $I_O=250mA$ to $750mA$                                   |              |      | 9     | 270   |
| Output Resistance                      | $f = 1kHz$                                               | 0°C to 125°C |      | 0.030 |       |
| Temperature Coefficient Output Voltage | $I_O = 5mA$                                              | 0°C to 125°C |      | -1.6  | mV/°C |
| Output Noise Voltage                   | $f = 10Hz$ to $100kHz$                                   | 25°C         |      | 200   | µV    |
| Dropout Voltage                        | $I_O = 1A$                                               | 25°C         |      | 2.0   | V     |
| Bias Current                           |                                                          | 25°C         |      | 4.8   | 8     |
| Bias Current Change                    | $V_I = 30V$ to $40V$                                     | 0°C to 125°C |      |       | 1.0   |
|                                        | $I_O=5mA$ to $1A$                                        |              |      |       | 0.5   |
| Short-Circuit Output Current           |                                                          | 25°C         |      | 120   | mA    |
| Peak Output Current                    |                                                          | 25°C         |      | 2.1   | A     |

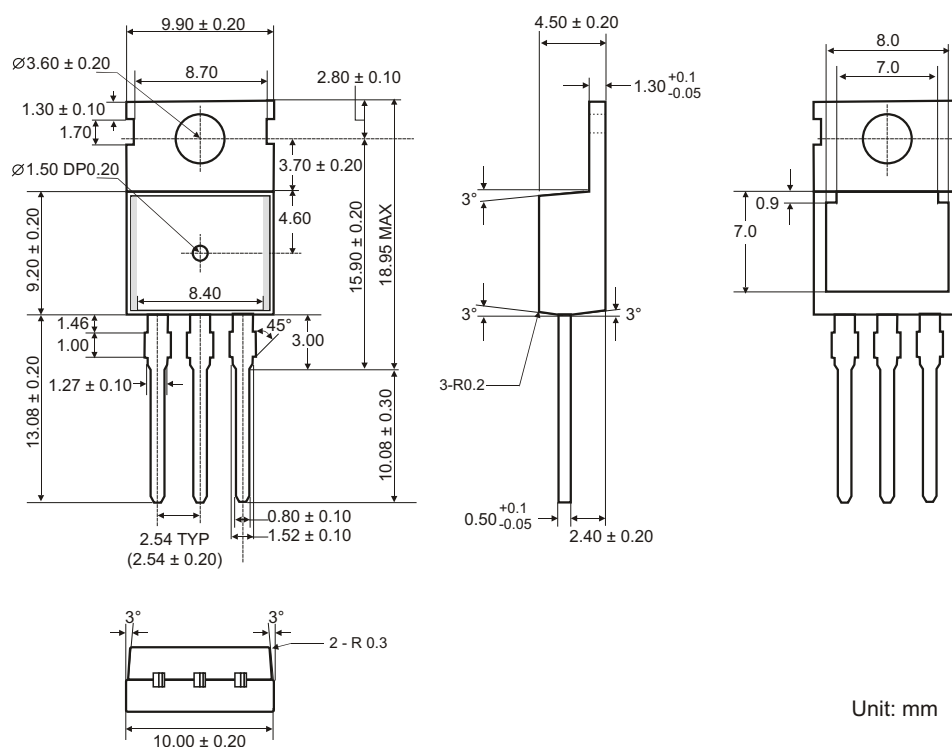
\*Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account.

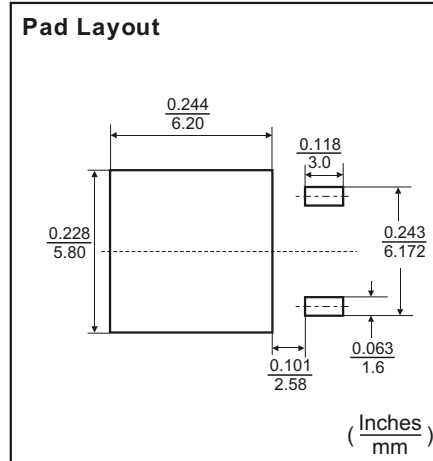
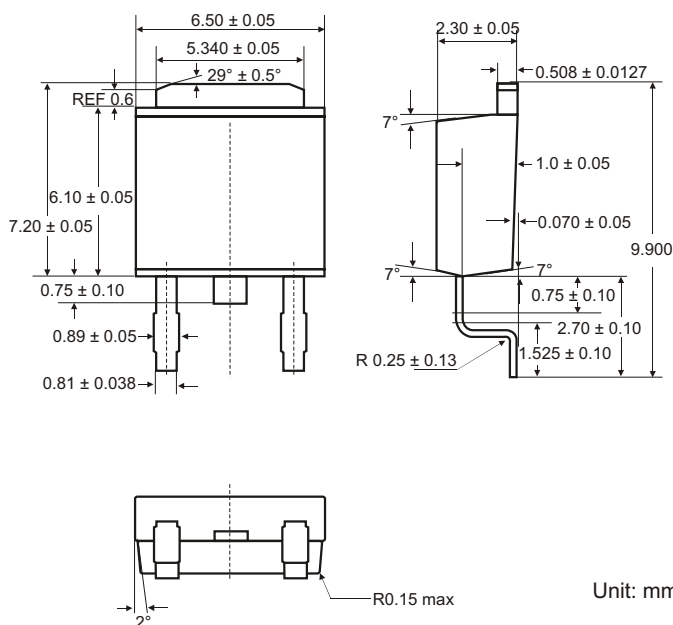
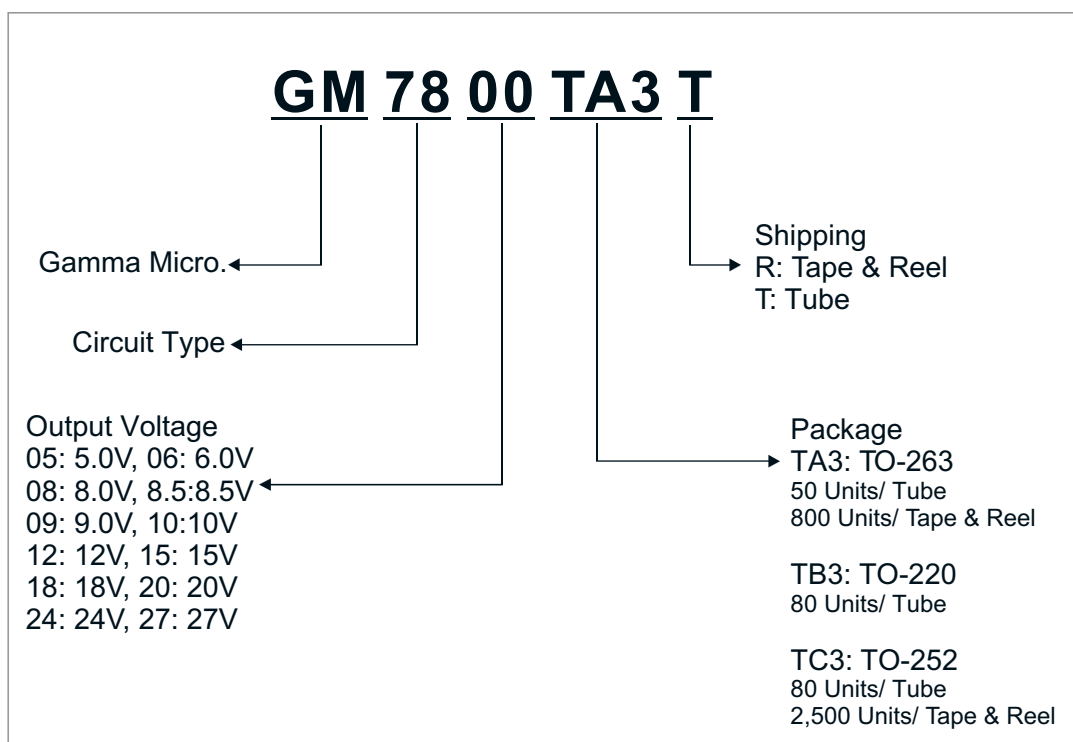
\*\* The specification applies only for DC power dissipation permitted by absolute maximum ratings

### ◆ TO-263-2 PACKAGE OUTLINE DIMENSIONS



### ◆ TO-220 PACKAGE OUTLINE DIMENSIONS



**◆ TO-252 PACKAGE OUTLINE DIMENSIONS**

**◆ ORDERING NUMBER**


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